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VETERINARY MEDICINE

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No. 5

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Pasture and skim milk are approximately equal in protein value for swine.

Chromic cat gut produces less irritation in tissues, except the skin, than any other common suture material.

It is most unprofitable to fool ourselves. If we do not recognize our shortcomings we are not apt to remedy them. If we do not admit the existence of leaks we are not likely to stop them.

When cysts are ruptured repeatedly, until they cease to form in one ovary of a cow they frequently develop in the opposite ovary and require rupturing one or more times there before the animal will conceive.

When 177 ewes at the New Jersey experiment station received one injection of pregnant mare serum (250 to 350 rat units) 22 of them came into heat and accepted the ram. Following a second injection of the serum 16 days later, 114 of the remainder also came into heat and were mated. Of the 136 ewes thus mated 70 dropped lambs at term.

One heel fly will lay 300 to 500 eggs, depositing them on the hair of legs of cattle. Within three to five days the eggs hatch and the maggots pierce the skin and start on the long journey through the body arriving and localizing in the back of the animal in about nine months. As many as 300 grubs have been taken from the back of one yearling calf and it is not uncommon to find 50 to 75 grubs in the back of affected animals.

Bilateral contraction of the flexor tendons is more common in mule colts than in horse colts.

Almost continuous uncontrollable emesis is a common symptom of uremia in the dog. In such cases the vomitus contains urea.

Fibrosarcoma are said to be far more frequent in sorrel mules than in mules of other colors or in horses.

In 1932 the average annual per capita consumption of ice cream in this country was 5.04 quarts; in 1940 it was 9.21 quarts, and in 1946 it was 19 quarts.

Entomologists at the University of Idaho report having discovered that wool from sheep dipped in DDT solution two years earlier was still moth-proof in storage warehouses, according to the Department of Agriculture.

The chief veterinary officer of the Royal Society for the Prevention of Cruelty to Animals in a recent letter to the *Veterinary Record* reports that in 1945 80,000 dogs and cats were electrocuted by the society at its 13 London clinics.

Corn-and-cob meal gave equal growth at lower cost than ground shelled corn when fed to growing chickens at the Ohio experiment station. When these feeds were fed to layers, ground shelled corn gave slightly greater production than corn-and-cob meal, but birds receiving the latter ration had noticeable better plumage and there was little or no feather picking among them.

Undulant Fever Scare Well Founded

"Undulant Fever Strikes First at Farm Family," "Brucellosis on the Increase," "Swine Brucellosis Most Dangerous for Man," "An Economic and Public Health Problem," are so many among other headlines quoted from current newspapers and magazines. Science literature is no less pessimistic. That is to say, brucellosis is a major public health problem and even more disturbing to the livestock farmer than was tuberculosis shortly after the turn of the century.

It is now about 30 years since Dr. V. A. Moore, bacteriologist, dean of the New York State Veterinary College, remarked that Malta fever was a "disease of the future." Even earlier (1911) Doctor Melvin, Chief of the Bureau of Animal Industry, with remarkable prescience had said: "We are dealing with a phenomenon that is ominously serious in its significance for public health." He was referring to discovery of Brucella organisms in 11% of the samples of market milk, which were examined. Prior to World War I, undulant fever[1] was not a grave threat to human health—anywhere. Today, it is a scare throughout the occidental world. As a chronic livestock disease, it differs from tuberculosis in that there is no dispute over the rôle of livestock in spreading the specific agent to human beings, nor is there any disagreement over its presence and significance in animal production. Eradication measures are not unpopular. Opinions differ only as to method.

Dubois *(Rev. de Méd. Vét. 97,* Nov., 1946: 520-553) reporting at length on the brucellosis situation in France points out that undulant fever was first declared a reportable disease by the public health service Oct. 23, 1923, and ovine and caprine brucellosis were not declared a contagious disease of animals until June 3, 1929. Moreover, up to the present time, the bovine infection has not been subjected to any legal action other than insignificant ministerial directives. There were 1,159 cases reported in the Midi (south of France) from January through October, 1945, which is but a fraction of the total cases because only a small percentage of the cases are routinely reported. The author estimates the number of cases for all of France at 9,000 of which 8,000 were in the Midi, the original source of Brucella infections.

Its growing prevalence in the U. S. A. is common knowledge among physicians and veterinarians. Ten years ago, a famous clinical dermatologist was outraged when a prominent veterinarian suffering from a terrific eczema of both arms suggested that the trouble might be a Brucella infection. "Nonsense. . . . Rub on this salve. Drop in next week. $10 please," terminated the interview. This is not an insinuation. It's just a historical fact that tells more about the expansion of this "disease of the future" than could be told in a long thesis crammed with statistics. It's remarkable what long steps a medical science can take in a decade.

Except for an explosive symptom in cows—abortion—knowledge of brucellosis in animals, like knowledge of the disease in man, was slow in developing in veterinary medicine. W. L. Williams' classical literature on genital diseases assigned small importance to the discoveries of Doctor Bruce and Professor Bang in the nineteenth century. Now brucellosis is "guesstimated" to be the second most costly disease of dairy cows in the United States. Human cases to the number of 5337 were reported in 1946. This was an increase of 11% over 1945, which in turn reported an increase of 25% over 1944. Several surveys have indicated that not more than one-tenth of the cases that occur in man are correctly diagnosed; in addition to the frank cases there are a vast number of subclinical infections, if antibodies in the blood stream is accepted as an indication of infection past or present.

[1] Dr. Alice Evans says: "The disease is now correctly called brucellosis."

Intrauterine Semen Injections Preferable

A comparison of the efficacy of intracervical and intrauterine inseminations at an artificial insemination center in South Devon (England) resulted in 56.1% of conceptions in 374 first inseminations by the intrauterine method and 33.4% in 377 inseminations by the intracervical method, *i.e.*, in first inseminations the rate of conceptions was 67.3% higher by intrauterine than by intracervical insemination. The comparison included all inseminations from two bulls over an eight-year period.

Goats in India

India is reported to have a total goat population of nearly 60,000,000. Common breeds include the Jamna Pari, a dual-purpose goat with an average milk yield of 540 pounds per lactation and an average fat percentage of 5.2. The Beetal (smaller than the Jamna Pari) has an average milk yield of 356 pounds and a fat percentage of 4.5.

The Kamori, a dual-purpose goat, is held to have considerable potentialities. With an average milk yield under ordinary conditions of jungle grazing, of four pounds a day, but a yield of up to eight pounds, and even 12 pounds, under conditions of intensive feeding. Kashmiri goats are not bred for milk production.—*The Australian Dairy Review.*

What's in a Name?

A nickname is the hardest stone that the Devil can throw at a man.—HAZLITT.

A lie may keep its throne a whole age longer, if it skulk behind the shield of some fair-seeming name—LOWELL.

Alice C. Evans, internationally renowned bacteriologist, discoverer of the generic identity of *Micrococcus melitensis* and *Bacillus abortus*, stated[1] recently:

"Nomenclature has played the mischief with brucellosis. Familiar names which suggested erroneous ideas made impressions so deep they could hardly be obliterated by contrary facts. The two generic names, Micrococcus, implying a spherical form of the causal organism of "Malta fever" and Bacillus, implying an elongated form of the causal organism of contagious abortion, prevented their comparison for 20 years. The names "Malta fever" and "Mediterranean fever" suggested a limited distribution of the disease, and this helped to prevent its recognition in other parts of the world. The name "undulant fever," suggesting that in every case there must be a significant rise of temperature tracing an undulating curve, exerts an influence now against the recognition of the chronic [form of the] disease."

In the veterinary field the names given this disease have been scarcely less unfortunate. "Contagious abortion" served primarily to facilitate the sale of Bowman's bran and brown sugar and Roberts' Waukesha water. Further, by accenting a single symptom of the malady, it confused many veterinarians and completely mystified most dairymen who were never able to understand "contagious abortion" without abortion.

Changing the name to "Bang's disease," was an attempt to counter the trend in scientific nomenclature and couldn't last, outside the pages of farm papers. However veterinarians can take satisfaction in their part in giving brucellosis a scientific name. It was a veterinarian, Karl Meyer, who first suggested (1920) the genus name of "Brucella" and another veterinarian, Ward Giltner, who introduced "brucellosis." Further all other names have disappeared from scientific veterinary literature. By contrast "undulant fever" is still common in medical journals, albeit becoming less common from year to year.

"Those who can't remember history must repeat it."

Now we see the same painful process slowly unfolding in the case of avian pneumoencephalitis. Again we have an eponymic term trotted out for no better reason than that a city or a molehill is more tangible than a syndrome or a pathological process. If Newcastle suggests anything it is carrying coals—metaphorically wasting labor. One might question just how extensively the disciplines of science are approved in the veterinary profession.

We are not blinking the fact that the motivation for the adoption of "Newcastle disease" in this country was professional jealousy. We ignore it since it is a matter of not the slightest concern to the generality of the profession. "Mourning of the chine" debased veterinary literature for two centuries and "wolf-in-tail," "hollow-horn" and "loss-of-cud" avoided their own obsequies for half that period. We should not lightly adopt a disease nomenclature that a future generation of veterinarians will not sanction. The promptness with which the fur industry abandoned "Chastek paralysis," when the pathology became known, is an example to emulate. Discontinuing the use of "range paralysis" affords another example of lay respect for scientific discovery.

About three weeks before photographing, this pedigreed white rock cock, around 18 months of age, was given 30mg of diethylstilbestrol, two 15mg pellets, subcutaneously at the base of the comb. At the time of the injection his comb was large and bright red, like any ordinary rooster of that age. There were eight other cocks, pen mates of this bird, treated at the same time. That they were losing male characteristics, becoming quiet with shrinkage of size and loss of color of the comb, became quite evident within five or six days. Because they had lost their inclination to fight, the birds were taken from the pen which also held untreated cocks. The feminizing continued. When this picture was taken this cock had reached the point where he was clucking like a hen. Although he still had long spurs, when he was killed, his meat, when served, was really tenderized—like a capon. It is recommended that birds so treated with stilbestrol, be kept not longer than a month as the testes may regenerate and the birds may develop male characteristics again. F. C. TUCKER, *at the 33rd Annual Short Course for Veterinarians, Purdue University.*

[1] Evans, Alice C. Brucellosis in the United States. *Am. J. Pub. Hlth.*, 37:2, pp. 130-151. 1947.

Veterinary Corps Officers Separated from the Service Since VE-Day

(Supplement to lists previously published)

Alabama

Harrell, Wilson Heath
Marsh, Ralph W.

Arizona

Smith, Augustus M.

California

Chapman, John H.
Foster, Stuart M.
Kelber, William J.
Laskey, Herbert H.
Taylor, Clarence E.

Colorado

Hanks, Sidney F.
McGrath, Harold B.
Smith, Luther C.

Delaware

Daugherty, Edward B.

Florida

Cunningham, Wm. W.

Georgia

Adams, Carroll P.
Bush, Thomas C., Jr.
Davis, Thomas C.

Illinois

Bott, Anthony R.
Cobble, John R.
Lichty, Dwight Lee

Iowa

Bailey, James W.
Baker, Durwood L.
Blair, Alvin E.
Ward, Norman R.

Kansas

Elliott, Wm. Dean
Grandfield, Roy M.
Hourigan, James L.
Lamont, Jack D.
Schoen, Edwin A.
Stonebraker, Earnest K.

Kentucky

Waite, Edward G.
Winkler, Jack Edward

Maryland

Fitts, Robert H.

Massachusetts

Phillips, Warren A.
Bentinck-Smith, John

Michigan

Goodband, George C.
Steuewer, George H.
Sullivan, David J.
Westcott, Roy Wm.
Wise, Gilbert H.

Missouri

Stoenner, Herbert G.

Nebraska

Campbell, Thomas C.

New Jersey

Simpson, Charles F.

New York

Armstrong, James
Clement, Edwin P.
Coye, Elmer N.
Mettler, John J., Jr.
Morse, Erskine V.
Porter, David B.
Rogoff, George
Sall, Irving Eugene

North Dakota

Calhoun, William H.

Ohio

Elliott, Herbert B.
Greenlee, Allan M.
Heinrich, Cyril L.
Heinsen, Paul B.
Stockton, Jack J.

Pennsylvania

Barnes, Lloyd D.
Bender, John W.
Dougherty, Ellsworth
Finkelstein, Jacob
Huebner, Richard A.
Patterson, A. Wm., Jr.
Ramey, Donald B.
Steadman, Henry Ree

Texas

Farrell, J. M., Jr.
Garrett, Robert M.
Grimes, George E.
Kerby, Duron R.
Riley, William E.
Whitman, James P., Jr.

Utah

Isakson, Eric W.

Washington

Ament, Roland W.
Dodge, John Richard
Herbert, Earl W.
Ryncarz, Alexander J.

* * * *

Regular Army Veterinary Officers Newly Appointed

The appointment of the following officers to the Veterinary Corps of the Regular Army has been announced by the War Department:

Capt. Clinton L. Gould, Eureka, Calif.

Capt. Daniel P. Sasmore, Rio Linda, Calif.

Capt. (Maj.) Nels F. Christensen, Cedar Falls, Iowa.

Capt. (Capt.) Jack H. Hempy, Groveport, Ohio.

1st Lt. (Capt.) Henry M. Miller, Dayton, Ohio.

Capt. (Capt.) Ralph D. Walters, Columbus, Ohio.

Capt. (Maj.) Conley G. Isenberg, Chandler, Okla.

Capt. (Maj.) Frank J. Davies, Swarthmore, Pa.

Capt. (Capt.) John H. Harrison, New Castle, Pa.

Capt. (Maj.) Everett B. Miller, Allentown, Pa.

1st Lt. (Capt.) William G. Brooks, Jefferson, Texas.

Capt. (Lt. Col.) Seidel M. Stephens, Fort Worth, Texas.

* * * *

Citation for Bronze Star Medal

Major John G. Cranfield, Veterinary Corps, Army of the United States. For meritorious achievement in connection with military operations against the enemy in the Hawaiian Islands and Okinawa, from 30 May 1942 to 1 August 1945. As War Dogs Veterinarian for the Hawaiian Department, Major Cranfield displayed outstanding professional knowledge and skill in initiating and executing policies relative to the selection, care and training of War Dogs. In addition, he performed invaluable services in Oahu as Commanding Officer of the Veterinary General Hospital and of the 113th Medical Service Company, competently training personnel and directing a comprehensive food security program. He subsequently served with marked distinction as Assistant Island Command Veterinarian during the assault on Okinawa despite most difficult combat conditions. Through his outstanding ability and devotion to duty, Major Cranfield made a vital contribution to the continued effectiveness of the Veterinary program in the Middle Pacific and Pacific Areas.

Major Cranfield is now separated from the service. His home address is 718 El Camino Real, San Carlos, California.

Legion of Merit Award

By direction of the President, under the provisions of the act of Congress approved 20 July 1942, the Legion of Merit for exceptionally meritorious conduct in the performance of outstanding services April 1944 to January 1946 was awarded by the War Department to Lieutenant Colonel Maurice W. Hale, Veterinary Corps, United States Army.

Lt. Col. Hale was on duty with the Joint U. S.-Canadian Commission in Canada during above period. Upon his relief from this duty he was assigned to the Veterinary Research Laboratory, Robinson Q.M. Depot, Ft. Robinson, Neb. Only recently he was assigned to the U. S. Military Ground Mission, Lima, Peru, replacing Lt. Col. Russell McNellis who has returned to the United States.

Foot-and-Mouth Campaign Directors and Board Members Appointed

Dr. Maurice S. Shahan, research scientist and veterinarian of the Bureau of Animal Industry, USDA, has been appointed co-director of the Mexico City office from which the Mexican-U. S. cooperative campaign against foot-and-mouth disease is to be administered.

Licenciado Oscar Flores, Mexico's Under Secretary of Livestock Industry, and Chairman of the Mexican section of the Mexican-United States Agricultural Commission, has been appointed director of the office.

The appointments conform with recommendations of the Mexican-United States Agricultural Commission March 6 that the administrative headquarters of the foot-and-mouth campaign should be in charge of a director named by the Mexican Secretary of Agriculture and Livestock Industry, and a co-director named by the U. S. Secretary of Agriculture.

Toxic Effects of Streptomycin

Balanced against the demonstrated value of streptomycin in suitable cases are some apparently toxic effects. Some of these are probably due to impurities in the drug but others seem to be specific for the drug itself. The most serious of these is what seems to be an irreversible damage to part of the eighth cranial nerve which appears when streptomycin is given in large doses by injection for more than ten days. This means that one's sense of balance may be disturbed for a long time, with possible attacks of dizziness and nausea. This was found in two army cases. A third patient showed partial deafness, indicating that there had been a poisonous effect on the other portion of the eighth cranial nerve, which is the path of hearing. Toxic nephritis also was noted.—*Release, Office of the Surgeon General.*

Hadley to Retire

For 35 years professor of Veterinary Science at the University of Wisconsin College of Agriculture, F. B. Hadley will retire June 30, 1947. He has been Professor of Agricultural Administration for the past two years.

Before joining the staff of the University,

Prof. F. B. Hadley

Dotor Hadley was Assistant Professor of Veterinary Anatomy under the famous Dr. Septimus Sisson at the Ohio State University. Prior to that (1907-09) he taught anatomy and surgery at the Washington State College.

Professor Hadley was born in Burlington, Vt., January 31, 1880, and was graduated from the College of Veterinay Medicine, Ohio State University in 1907. He pursued graduate work at the Washington State College, the University of Chicago and the University of Wisconsin.

Glanders Among Laboratory Employees

Primarily an equine disease, glanders occurs naturally in two forms, (1) acute or chronic systemic glanders and (2) cutaneous glanders. In the past the disease in man has usually been contracted by direct or indirect contact with infected horses. During the past 30 years, however, owing to constant testing of horses and eradication of infected animals, this disease has been rare in this country. The only case known by the writers to have occurred in the United States in recent years was described by Herold and Erickson in 1938. The disease occurs more frequently in Russia, the Balkans and parts of Asia and Africa where veterinary control measures are less stringent or nonexistent. A number of accidental infections have been recorded in the past among laboratory workers—six such cases having occurred in a single year.—Howe, Calderon, and Miller, Winston R.: Human Glanders: Report on Six Cases, *Ann. Int. Med.*, January, 1947, from *J. Am. Med. Assn.*

Veterinary Service of Colombia

The Republic of Colombia, our nearest South American neighbor has a veterinary service that contrasts with that of the United States and Canada. Colombia has an area one-seventh that of Canada but its population of 10,249,670 is only one-fifth less than that of the Dominion. Its livestock numbers 500,000 horses; 350,000 mules; 300,000 asses; 9,000,000 beef cattle; 3,000,000 dairy cattle; 1,000,000 sheep; 120,000 goats; 600,000 swine and about 14,000,000 fowl.

There are 252 veterinarians in the country. They are employed, 15 in the Ministry of Health; 114 in the Ministry of Agriculture; 20 in the Army; 20 on the Veterinary Faculty of the University of Bogota; 28 in Departments (political subdivisions analogous to states in this country), 30 in municipalities and 24 in private practice.

Meat inspection includes an ante-mortem and post-mortem inspection of all animals slaughtered at the abattoirs. It is conducted by the Ministry of Health veterinarians. In addition there is a products' inspection of all foods of animal origin, including fish and fowl, by the municipal veterinarians, when it is placed on the market.

Disease control among animals is the province of the veterinarians in the Ministry of Agriculture, except in the cities where it comes under the control of the municipal veterinarians, who constitute a section of the municipal health service.

The municipal veterinary service, in addition to the meat products inspection already mentioned, has supervision of the sanitation of places where meat food products are stored and sold, has the same supervision over the milk supply, tuberculin tests the herds supplying milk to the city, supervises the transport of animals through the city and originates measures for the control of rabies.

The Department veterinary service is concerned with the eradication of diseases such as piroplasmosis, babesiosis and anaplasmosis and the control of some plagues such as blackleg, anthrax, brucellosis, hog cholera and trypanosomiasis. They also recommend and enforce quarantines and regulate the traffic in animals from one Department to another. In emergencies when a disease is spreading rapidly the Department veterinarians and municipal veterinarians cooperate with those in the Ministry of Agriculture and the livestock sanitary organizations.

Rabies control and eradication is the result of a close cooperation among members of the animal protection societies, and municipal veterinarians. The municipal authorities provide compulsory regulations which are well enforced. The local humane association provides vaccination centers and the municipal health department supplies antirabic vaccine free.

Information concerning the veterinary service in Colombia was supplied by Dr. Jose Gonzalez Alvarez of Cartagena, Colombia. Doctor Gonzalez is at present taking post-graduate work in Animal Husbandry and Animal Disease Control at the Utah State Agricultural College.

Message of the Veterinary Association of Portugal to Foreign Confreres

Now that humanity, still hurt, bloody and hardly emerged from the war, is trying to clear the way towards just and lasting peace within the international fraternity, the Portuguese Society of Veterinary Medicine, conscious of the ecumenical character of science and of the outstanding rôle of cultural exchanges in reëstablishing the spiritual peace and the moral atmosphere, short of which any effort to secure peace would be doomed, salutes all colleagues and foreign veterinary institutions and expresses its desire to build up friendly ties and closer professional relations with them.

The learned persons—trained in similar disciplines and moved by the same ideology drawn from the same source—are especially qualified to initiate the *entente* and the conciliation we all desire after the hard years we have experienced. All of us are undoubtedly anxious to consecrate ourselves to this task.

The veterinarians of Portugal, unanimously, are set to work for reconciliation and *rapprochement* of the nations. Their national association proclaims its profound desire to promote exchanges and cultural ties with other countries and a liaison among the veterinarians of Portugal and their foreign confreres. The Society pledges to foster better mutual acquaintance, comprehension and appraisal. It would also be much to its liking to see the international veterinary meetings restored in the near future.

The Society is planning to organize an exhibition depicting the "Veterinary Activity in the World" which will coincide with the next annual National Congress of the Society which is to be held in Lisbon, May 26 to June 3, 1947, under the patronage of the President of the Republic. This exhibition will offer a complete view of the rôle of the veterinary profession in modern life, in the past, at present, and in the future. It will stress the value of the contributions of veterinary medicine to the advance of science in general.—Prof. Dr. Joaquim Fiadeiro, *President of "Sociedade Portuguesa de Medicina Veterinaria."*

Six Needs of Artificial Insemination Centers

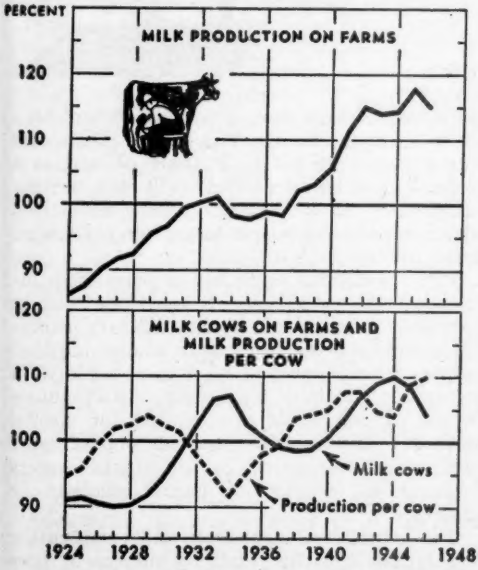
1. A rapid method for determining the quality of a sample of semen.
2. A means of storing semen for six instead of three days without materially lowering the quality.
3. Better trained technicians and less labor turnover among them.
4. Better selection of cows to be inseminated.
5. Dairymen that can determine when a cow is in heat and who will telephone the insemination center early in the morning.
6. A quick simple test for determining pregnancy at an early stage.

Spray Trucks a Success

Army decontamination trucks (500 of them) have been converted into cattle sprayers and distributed to a score of states, where farm boards and schools operate them from central points for the benefit of livestock owners in neighboring counties. Reports from rural regions indicate that these spray trucks are proving successful in every test.

MILK COWS, AND MILK PRODUCTION, UNITED STATES, 1924-46

INDEX NUMBERS (1935-39=100)



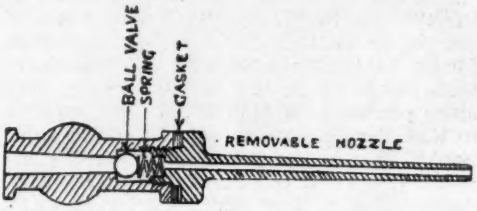
—Courtesy U. S. Bureau of Agricultural Economics

Milk production in 1947 may decline slightly from the 119 million pound total in prospect for 1946. Cow numbers may be further reduced in early 1947. Milk production per cow, however, probably will equal or exceed the record rate of about 4,850 pounds for 1946. Sharp culling of milking herds during the past year, with removal of low producers, and ample feed-grain and hay supplies favors continued high production per cow in 1947

Special Nozzle for Intramammary Infusion

It was found when infusing udders, using a 50cc syringe, there was sometimes a slight flow of milk into the syringe before injection, thus making it necessary to use a fresh syringe for each cow. This is cumbersome and expensive when several animals are to be treated.

The nozzle illustrated below is designed for use in place of the normal teat siphon. It possesses a non-return ball valve, which effectively prevents backflow into the syringe. Sufficient sterile nozzles for the day's work are carried,



and a fresh one used for each quarter.

Only one or two sterile syringes are necessary. Before boiling, the nozzles are injected through with cold water. The drawing is self-explanatory. The ball and spring are made of stainless steel, and the ball must fit the seating perfectly. The spring should be sufficiently strong only to return the ball to the seating. If too strong, injection is made difficult.—J. McLintock, MR.C.V.S., in the *Veterinary Record*.

Large Increase in Purebred Livestock Importation

During 1946, the USDA certified the pure breeding of 32,406 domestic animals offered for importation. The number represents a gain of 27% over the importations of the preceding year and a still greater increase over previous years. The numbers certified were: 27,607 cattle, 3,101 sheep, 1,192 swine, 902 dogs, 139 horses, three goats, and two cats. Most of the importations were from Canada but 10 other countries, including the Island of Jersey, were represented. The shipment of 74 cattle from Jersey was the first since the war.

The leading breeds of cattle certified were Holstein-Friesians, Ayrshires, and Jerseys. In sheep, the largest importations were of the Suffolk, Southdown, and Hampshire breeds. Purebred swine importations were chiefly Yorkshires, with Berkshires second, and Tamworths third. In horses the leading breeds were Thoroughbred, Clydesdale, and Standardbred. All the goats were of the Anglo-Nubian breed. The Department's report on dog importation does not itemize breeds.

Canine Predators

R. W. Pease, Director of the Bureau of Dog Licensing New York Department of Agriculture and Markets, states that 441 cattle, 5500 sheep and 56,000 fowl were killed by dogs in the Empire State during 1946. The number of dog licenses has doubled in the past 25 years and the number of claims paid for damage to livestock has tripled.

New York City Dogs to Be Vaccinated

Because of the rapid increase of rabies in the city, the New York City Board of Health will require by law the vaccination of all dogs. During 1946 more than 100 rabid dogs have been picked up in the city and nearly that many persons have been bitten and compelled to take the long course of antirabic inoculations. Three of the Boroughs of the city already were under dog quarantine. It has been decided that no free clinics will be set up by the city to provide this vaccination service.—*Am. J. Pub. Hlth.*

Rabies Control in New York State

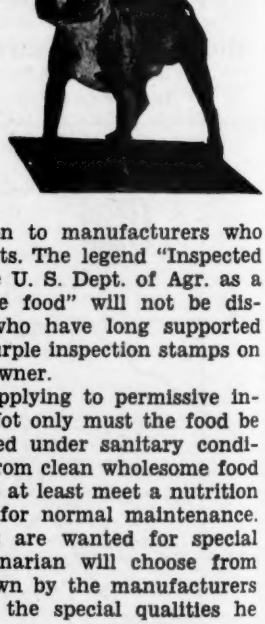
"Our confidence in vaccination against rabies has been strengthened by the results so far in Central New York. Some of the dogs in this area were known to have become infected from foxes. This being largely a rural area, dog control as a preventive measure leaves something to be desired. In this same area, more than 70% of the dog population has been immunized. During 1946, there was an increase of the disease. We estimate that several thousand foxes died of the disease; before doing so, some of them infected in the neighborhood of 400 cattle. We cannot help but believe that some of them also fought with the rural dogs. If rabies vaccination were useless, we would expect the distribution of cases of rabies in dogs in this area to be three in vaccinated, for every one in non-vaccinated animals.

"Actually, of 62 cases of canine rabies where the status with respect to vaccination is known, only two have occurred so far in vaccinated dogs. We believe this area to represent one of the best field experiments in vaccination that we know of. The fact that there must have been a challenge of the immunity of the dogs, is responsible for our increased confidence. We still believe in dog control as a means of preventing the dissemination of this disease among dogs and as a protection to human beings. We also include provision in our plan, for the mass vaccination of dogs as a means of preventing its spread."—A. Zeissig, N. Y. Dept. of Health.

What Shall I Feed My Dog?

"Doctor, what shall I feed my dog?" There is no veterinarian in small animal practice that has not been asked that question thousands of times. For too long the veterinarian has had little help in finding the answer. There were many brands of dog food all loudly claiming perfection. A few were excellent, many mediocre and, far too many, inferior. Reports of scientific research narrowed his field; the reputation of the manufacturer and his own experience enabled him to make sound recommendations in answer to the constantly recurring question, "What shall I feed my dog"? However, he could never be sure he was not doing some worthy food and deserving manufacturer an injustice.

Insofar as canned dog foods are concerned the veterinarian now has support in his selections. The action of the USDA in granting permissive inspection to manufacturers who meet its requirements. The legend "Inspected and certified by the U. S. Dept. of Agr. as a normal maintenance food" will not be discounted by those who have long supported unequivocally the purple inspection stamps on meat for the dog's owner.



For the first time, dog food is now available bearing a USDA inspection label

The regulations applying to permissive inspection are rigid. Not only must the food be inspected and packed under sanitary conditions and be made from clean wholesome food products but it must at least meet a nutrition minimum adequate for normal maintenance. When canned foods are wanted for special purposes, the veterinarian will choose from this base, foods shown by the manufacturers research to possess the special qualities he desires.

The permissive inspection and certification regulations are the result of months of preparatory work by the USDA and on the recommendation of a number of dog food manufacturers who were making a quality canned dog food. The permissive inspection and certification act, gives pet owners a guide in addition to brand name and company reputation, in buying prepared food for their pets.

History of the Cat*

The cat is a mammal of the order of digitigrade carnivores, of the family Felidae, which includes the lion, panther, leopard, serval, cat, jaguar, cougar, lynx, cheetah, etc. The word cat comes from the Latin word *cattus*, which appeared very late in the Latin language, a common word which, with the word felis, served to designate it; according to some the word cat derives from the word *cautus*, meaning artful, sly, according to others, from cattus, (cattare, to seize) because the cat lies in wait for its prey, seizing it when it comes within reach.

The cat is characterized by a short muzzle, a rounded cranium, short and very strong jaws, five digits on the fore limbs, four on the hind limbs, equipped with completely retractile claws and a generally well-developed tail.

Fossil bones of the cat have been found in Germany, in England and in France. The naturalist de Blainville believes that in the middle tertiary period, fourteen species of cats, whose size might vary from that of our present cat to that of a pony, inhabited the vast forests which covered the globe; most of them may still be found today, but some have disappeared from the face of the earth.

According to Pictet, the cat was considered a domestic animal by the Egyptians under the 12th dynasty (about 2200 years B. C.) and held in great veneration. Ruppel believes it was introduced into Egypt after the conquest of Ethiopia where it originated. It was deified in early antiquity, the god of music being represented by a human body surmounted by the head of a cat, holding a sistrum in the hand; and the goddess of love by a woman's body with a cat's head; at Memphis, the more closely the beauty of women approached the cat type, the more it was valued.

Every Egyptian temple harbored a family of cats, and a number of children were vowed to the cat; this fact was a source of enormous revenue for the priests, who sold little medals representing the head of the temple cat where the vow had been pronounced. The cat was the emblem of the sun and of Osiris, and according to de Gaylus, the female was the emblem also of the moon and of Isis. There even existed a temple, at Bubastis, in the Delta, where the goddess Isis was worshipped in the image of a cat.

In the time of Herodotus (430 B. C.) when a cat died in an Egyptian house, all the inmates shaved their eyebrows as a sign of mourning; the cadaver, carefully embalmed with aromatics, was placed in a little coffin reproducing the shape of the animal in bronze or wood painted in rich colors, with enamel eyes, and often encrusted with gold. Then, with the highest magistrates following, the body was carried to a special cemetery for cats for burial. In 1890 such a cemetery was found near Beni Hassan, with 180,000 cat mummies, which were taken to London. Near the cemetery was a chapel cut in the rock, consecrated by the kings of the 18th (1703-1462 B.C.) and 19th (1462-1288 B.C.) dynasties to a local cat-headed goddess.

Some of the mummies were merely covered

"The more closely the beauty of women approached the cat type, the more it was valued"

with wrappings, others were enclosed in coffins. Other subterranean cemeteries were found at Bubastis, at Sakkarah and near Thebes; the mummies were of three species: *Felis caligulatus, Felis bubastis* and *Felis chaus.*

If anyone killed a cat, even by accident, he was set upon by the people and put to death with torture. It was believed the cat had the gift of getting rid of serpents; some writers think the veneration in which it was held was only gratitude for the services it rendered in destroying the rodents which overran Egypt after each inundation of the Nile.

Neither the Assyrians nor the Babylonians knew of the cat, and the Bible does not mention it; but a Sanskrit work dating from 2000 B.C. speaks of the cat as already domesticated.

Much later the cat was introduced into Syria and Arabia, where it became the preferred animal of the prophet Mahomet. Pliny has written that the Arabs worshipped a golden cat; and the Turks considered the cat a pure animal, cherishing it in their homes, while they proscribed the dog as an impure animal. Even now, cats are still held in high honor by all Mohammedans.

Homer speaks of cats with great respect, and Corinth has a colossal bronze statute representing a crouching cat. The Vandals and other tribes adopted the cat as an emblem of liberty, since it could neither be conquered nor enslaved; Favyn gives their devise as "argent, with a sable cat." The heraldic description of the cat is given as *"hérisoné,"* if the back is higher than the head, *"effarouché"* if it seems to be rampant.

*From "Le Chat, Raceo-Elevage-Maladies," by Larieux, E, and Jumaud, Ph. Vigot frères, Paris. 1926.

Sulfathalidine in Swine Enteritis

Further Obesrvations Regarding the Management of Enteritis Among Feeder Pigs with Sulfathalidine

By E. V. EDMONDS,* D.V.S.,
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ENTERITIS among swine in California is a serious problem in many localities. In certain years the incidence of infection notably is greater than in others; the reason for this, as yet, has not been established. Reports regarding this clinical entity emanate from areas where animals are fed a ration consisting of garbage, garbage and grain, or grain and pasture with or without a supplement. It should be mentioned, also, that many ranchers raise pigs as feeders until a weight of approximately 25 to 40 pounds is reached; these animals then are fattened for the market on ranches near cities where garbage is obtainable readily. Outbreaks of swine enteritis have been reported among pigs fed one or all of the rations mentioned above. In the experience of the author, a particularly high incidence has been observed among swine fed upon garbage exclusively.

Outbreaks of enteritis frequently are observed, also, shortly after swine are vaccinated for the prevention of hog cholera with antiserum and virus. Postvaccinal losses in swine due to enteritis have been reported by Breed[1] and Graham,[2] *et al.* and have been observed in many herds by the author. The clinical symptoms of postvaccinal enteritis in feeder pigs generally are observed within from 7 to 21 days following vaccination against hog cholera. Symptoms of the enteritis complex are elevation of body temperature (ranging from 104° F. to 108° F.), usually loss of appetite, diarrhea (in some cases the feces contain blood), and rapid dehydration. The pigs move with a stiff gait and an arched back, and some appear quite weak.

The author has conducted autopsies upon numerous pigs that have succumbed to this enteric condition. A resumé of the findings are as follows: The skin over the abdomen and axillary regions usually shows a reddish-purple discoloration. Definite evidence of gastroenteritis almost invariably is present. The gastric and intestinal mucosa often is markedly inflamed although in some cases it appears to be only mildly affected. The pyloric and ileocecal valves usually are congested. The mucous membrane of the cecum and colon is uniformly hyperemic, often dark in color, and sometimes shows evidence of diphtheritic inflammation and ulceration. The contents of the cecum and colon are rather soft and at times may be watery. Mucus and blood may be present. The cervical, mediastinal, mesenteric, and internal iliac lymph nodes usually are enlarged and congested, and sometimes are bluish-black in appearance. Seghetti[3] has presented an excellent description of post-mortem findings in his report on salmonellosis in swine. These were very similar to our observations in this type of enteritis.

Reports by Kernkamp,[4] Graham,[2] *et al.*, Thorp[5] and the previous experience of the author,[6,7] with the use of sulfathalidine (phthalylsulfathiazole) in the management of this condition in suckling and feeder pigs and in mature hogs, stimulated interest in further study of this compound, as reported herein, in the treatment and prevention of postvaccinal enteritis of swine. Since this agent first became available, the author, with the cooperation of swine owners, has conducted numerous experiments with many groups of pigs showing symptoms of enteritis and the results to date have been eminently satisfactory.

It should be stated at this point that no untreated controls were available in the conduct of this clinical study. From a scientific standpoint this is regrettable, but lack of controls, in this instance, may be understood readily, when one is familiar with the economics involved. The owners of these animals make their livelihood by raising and feeding pigs. With the prospect of a profitable financial return from marketable animals, it was desirable from their viewpoint to save as many animals as possible. It is the opinion of the author that many of the animals included in this study would have succumbed or would have remained unthrifty had the sulfonamide been denied; however, in all the herds mentioned in this report, a number of pigs died previous to therapy, as a result of enteritis. The number of deaths in each herd ranged from 2 to 32. Post-mortem examinations were conducted on most of these animals and swine enteritis was established as the cause of death in each case. The clinical symptoms of the remaining animals were similar to those observed among the fatalities; therefore, at least by inference, one may consider the untreated

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pigs, that died prior to therapy, as controls. Post-mortem examinations of the carcasses of a majority of these animals were made by the author, and swine enteritis was confirmed as the cause of death.

Table I presents data obtained from 12 herds of swine, including a total of 869 feeder pigs that were treated for enteritis. All of these cases developed within three weeks following vaccination against hog cholera. In 10 of the 12 herds, 158 deaths due to enteritis occurred prior to treatment. The pigs weighed between 25 and 120 pounds, the majority ranging from 40 to 60 pounds. These animals were fed a ration of garbage or garbage and grain; the garbage was collected in nearby cities and towns. Housing and sanitary conditions varied from ranch to ranch, and were classified generally as fair or inadequate. Whenever possible, sick animals were placed in separate pens, but no change was made in the daily ration. Treatment of the clinical cases con-

TABLE I.—POSTVACCINAL ENTERITIS IN SWINE TREATED WITH SULFATHALIDINE

Herd	No. dead when treatment began	Animals			Treatment			Results		Remarks
		No. treated	Approx. wt. lb.	Ration	Grams per day	Doses per day	No. days treated	Recovered	Died	
1	28	169	40-60	Grain & garbage	4	1	3	134	35	Several animals showed evidence of ascariasis and trichuriasis at autopsy.
2	8	70	40-120	Grain	4	1	1-62 2-8	68	2	15 of this group were sick at least 3 days before treatment.
3	7	40	35-80	Garbage	4	1	3	38	2	In another group on this farm 64 out of 71 died a few weeks previous to this experiment. A similar clinical picture.
4	15	165	35-80	Garbage	4	1	3-150 4-15	158	7	76 in a group of 143 died 3 months previously showing identical symptoms.
5	32	35	40-60	Garbage	4 2	1 1	1 2	25	10	Some of the animals that died prior to treatment and examined post-mortem showed evidence of lung worms.
6	5	10	40-75	Garbage	4	1	3	10	0	Owner lost numerous animals on this ranch during the past 2 years under similar conditions with the same clinical symptoms.
7	28	250	25-65	Grain & garbage	4	1	2	246	4	Owner has had extremely severe losses with post-vaccination enteritis in feeder pigs in previous years.
8	15	25	25-30	Garbage	2	1	3	23	2	Previous to treatment several lots lost 25 to 50% from enteritis.
9	8	83	40-60	Garbage	4	1	1-65 2-15	80	3	Many of the animals that were treated were quite sick at the beginning of the experiment.
10	2	8	25-45	Grain & garbage	4	1	2	8	0	Two of the treated hogs developed into best of lot of 40 within 120 days.
11	3	7	40-80	Garbage	4	1	3	7	0	Owner suffered heavy losses from enteritis in his herds in previous years.
12	7	7	40-60	Garbage	4	1	3	7	0	Five months previously owner lost 15 of a group of 32 pigs showing very similar symptoms.
Total	158	869						804 92.5%	65 7.5%	

sisted of administration of 2gm or 4gm of sulfathalidine *per os* daily to each animal. The drug was administered for one to four days depending upon clinical progress. The tablets were given with long-handled forceps and best results were realized when the compound was given at the onset of clinical symptoms.

It may be noted also from table I that 804 of the 869 animals included in the study recovered following treatment with sulfathalidine. The survival rate, therefore, was 92.5%. A majority of these animals received the compound once daily for two or three days and 127 of these animals that they were well repaid for their cooperation in the clinical studies.

Since sulfathalidine obviously was an effective agent for the treatment of postvaccination enteritis in pigs, it was decided to use the drug prophylactically, using similar animals, in an effort to prevent this condition. This second study was conducted over a period of eight months on many ranches where postvaccinal enteritis previously had caused mortality of from 25 to 90% of the feeder pigs. As a consequence, the operators were not only willing but anxious to cooperate.

TABLE II.—THE PROPHYLACTIC USE OF SULFATHALIDINE* FOR THE PREVENTION OF POSTVACCINAL ENTERITIS IN FEEDER PIGS

Herd	Animals: No. treated	Animals: Approx. wt. lb.	Ration	Treatment: Grams per day	Treatment: No. doses per day	Treatment: No. days treated	Results: No. escaping enteritis	Results: No. developing enteritis	Remarks
1	150	35-40	Garbage	4	1	1	145	5	Five pigs that developed enteritis received an additional 4gm sulfathalidine for 2 days. One animal succumbed.
2	100	30-40	Garbage	4	1	2	95	5	Five pigs developed enteritis after vaccination. On 7th and 10th day they each received 4gm sulfathalidine. One animal succumbed.
3	202	45-55	Garbage	4	1	1	196	6	The six animals that developed enteritis were not treated subsequently and succumbed.
4	320	40-50	Grain & garbage	4	1	1	298	22	Drug was administered in the drinking water. There is a question if each animal consumed its proportionate share.
5	200	45-55	Grain & garbage	4	1	1	180	20	Owner lost many pigs in previous years from enteritis soon after vaccination. The 20 animals that developed enteritis each received 4gm sulfathalidine. 18 recovered.
6	50	20-30	Garbage	4	1	1	50	0	No symptoms of enteritis developed after vaccination. Owner had suffered heavy losses among pigs from this condition during past years.
Total	1022						964 94.3%	58 5.7%	

*The drug was administered on the day before or on the day of vaccination with hog cholera antiserum and virus.

animals received but one dose, which apparently was sufficient to check the diarrhea. Fifteen animals received the drug once a day for a period of four days. Some of these were extremely ill or moribund when treatment was instituted. Sixty-five animals that were treated succumbed: a mortality of 7.5%. This rate is low when compared to losses observed among untreated herds, which frequently reach 85%. Accordingly, it would appear that the expense and time required to treat the animals enumerated in table I definitely was justified. Moreover, it is the firm belief of the owners

Pigs on these ranches usually are vaccinated against hog cholera 10 days before weaning, within the first week after weaning, or following transport to a second ranch. The method employed (except in one herd) for the prophylactic treatment, consisted in giving one dose of sulfathalidine either on the day prior to or on the day of vaccination. The majority of the animals weighed from 30 to 60 pounds; those weighing less than 30 pounds received 2gm of the drug; those weighing more than 30 pounds received 4gm. Following treatment and vaccination the pigs were observed carefully each

day for the initial symptoms of enteritis, such as loss of appetite and diarrhea, which are likely to appear between 7 and 21 days following vaccination. If signs of enteric disturbances were noted, the dose of sulfathalidine was repeated. In the event that recovery was not apparent on the following day, a third dose of same size was given.

It will be noted from table II that 1022 pigs on six different ranches were treated prophylactically with sulfathalidine on the day preceding, or the day of, vaccination against hog cholera. Of these, 964 animals or 94.3% did not develop enteritis within 21 days following vaccination, while 58 or 5.7% developed clinical symptoms of swine enteritis. This is in marked contrast to the previous incidence, cited above, of from 25 to 90%.

Post-mortem examinations were conducted on a sufficient number of pigs, that succumbed in herds 1, 2, 3, 4, to confirm the diagnosis of swine enteritis.

In one group of 320 animals to which sulfathalidine and sodium carbonate monohydrate were administered in the drinking water,* 22 pigs developed enteritis. The dosage of sulfathalidine was computed so that each pig, if the intake of water was equitable, would receive 4gm of the compound. The average weight of the pigs in this herd was approximately 45 pounds. Seven of the 22 that developed enteritis received one oral dose of 4gm of sulfathalidine in tablet form and recovered. It is believed that a majority of the remaining 15 that succumbed would have been saved if they had been given additional individual treatment. Administration of the drug in drinking water entails less labor than individual medication with the tablets; however, it appears to be considerably less effective since apparently ingestion of the proper dosage cannot be assured.

Summary

The therapy and prevention of swine enteritis among feeder pigs with sulfathalidine (phthalylsulfathiazole) is discussed.

In this study, 869 feeder pigs suffering from enteritis were treated with 2 to 4gm of sulfathalidine daily for a period of two to four days. Of the 869 pigs so treated, 804 or 92.5% recovered and 65 or 7.5% succumbed.

In a group of 1022 feeder pigs that received one or two doses of 4gm of sulfathalidine prophylactically on the day prior to, or on the day of, vaccination with hog cholera antiserum and virus, the incidence of postvaccination enteritis was reduced. Of the 1022 animals so treated, 964 or 94.3% did not develop enteritis within 7 to 21 days after vaccination while 58 or 5.7% of the pigs developed clinical symptoms during this period.

Sulfathalidine is an effective agent in the therapeutic and prophylactic management of enteritis in feeder pigs. Relatively small amounts and few doses of the drug are necessary to produce beneficial results. Since it is possible, in most instances, to treat and to prevent postvaccination enteritis successfully with one to three 4gm-doses of sulfathalidine, it is evident that oral administration of this agent is economical as well as practicable.

*Formula: 400gm sulfathalidine powder, 400gm sodium carbonate (monohydrate), 5 gallons water, mixed in 50 gallons of drinking water.

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In all herds included in this report, a diagnosis of enteritis was established by post-mortem examinations. The results of vaccination with hog cholera virus and antiserum were eminently satisfactory when the vaccination was preceded by a dose of sulfathalidine, 2 gm for pigs weighing up to 30 pounds and 4 gm for larger pigs

Hormone Treatment of Apparent Senility in Dogs

By C. HERMAN BECKMAN
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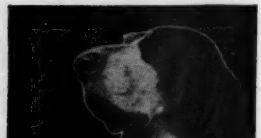

THE use of sex hormones to bring about rejuvenation, long a controversial subject in human medicine, is successful in veterinary medicine, under certain conditions and within rather definite limitations. It is not something that is going to turn back the clock or avoid the old man with the scythe on his allotted date. However, in certain pathological conditions in dogs, due as I believe, to an imbalance of the sex hormones, the use of ovarian hormones in the male and orchitic hormones in the female has given me remarkably satisfactory results in my practice. I have no other support for this thesis than clinical observation. It will not satisfy researchers but I surmise will not be without interest to others, who make their livings, as I do, by the practice of veterinary medicine.

The cases in which hormone treatment is indicated for its rejuvenating effect are those prematurely old dogs that are suffering from anemia, asthma, arteriosclerosis, cardiac sclerosis, kidney disturbances, loosening of the teeth, dental decay, stiff joints and ugly dispositions. They present an accurate picture of genuine senility, but their ages contradict the story the symptoms tell. Such dogs are common in the age range of six to 12 years. They are sick dogs not old dogs, however successfully they counterfeit the characteristics of age. It is generally recognized that persons grow old in different ways. We speak of some as having "grown old graciously" of others as being "old and crabbed." We speak of these prematurely aged dogs with their ugly dispositions as being "old and cross," and caution children to avoid them.

Neoplasms, usually carcinomas, are common in dogs at this period in their lives. In earlier publications[1,2] I have recorded my experience in treating these new growths by injection of the opposite sex hormone, i.e., orchitic hormone in the female and ovarian hormone in the male. These neoplasm cases commonly exhibit, in addition to the tumors, the same syndrome as the prematurely senile. In fact, we may look upon a majority of these tumors as being just another symptom of hormone imbalance, which like each of the other symptoms is often, but not always, present. The experienced practitioner will not expect every symptom to be present in every case.

The rejuvenation experienced where sex hormones are used in indicated cases is functional as well as physical. Vision, for example, is improved in animals that are partially blind and give indication of being on the way to total blindness. Restoration of the reproductive function in an animal that has become wholly impotent is easily measured. I have seen normal active virility restored in cases of complete impotence. Not only a restoration of libido but of fertility as well. Don't ask me why opposite sex hormones will suppress the reproductive function in normal animals and restore it in these abnormal animals of a certain type. I'm reporting clinical observation; not theorizing in the realm of endocrinology.

There is not much in the way of contraindication to keep in mind. Vitamins of the B complex, particularly B_1 should not be given during the period of hormone treatment. These vitamins in some way neutralize the effect of the hormones. Dosage of the hormones within reason is safe and to a considerable extent a matter of trial. This is a characteristic of all organotherapy. The average dose is indicated in the case reports that follow. Improvement should be apparent in a matter of a fortnight, following the first injection. If improvement is not observable in that period the dose should be increased. If a reaction simulating shock follows any injection the size of the next dose should be decreased. Not every case is going to recover from hormone treatment—there are not any 100% remedies in medicine; nor any 100% veterinarians. So take another look at the diagnosis if the case doesn't improve as it should.

Accurate diagnosis is essential to success with any type of therapy and is none the less important in organotherapy. Sex hormones are not a panacea for all the ills of the prematurely senile dog. It is not a remedy for a genuine chronic nephritis. There are other

[1] Beckman, C. Herman. Sexual hormones in the treatment of mammary tumors in aged bitches. *Vet. Med.*, 40:1, pp. 20-23. 1945.
[2] Beckman, C. Herman. Sexual hormones in the treatment of prostatitis and neoplasms of aged dogs. *Vet. Med.*, 40:7, pp. 235-237. 1945.

causes of blindness than senile cataracts and some dogs are naturally ill-tempered. If the diagnosis is wrong the treatment can hardly be expected to be right.

Prognosis is not less important than diagnosis. One must select his cases with discrimination if his average of cures is to be high. Even though the diagnosis be correct, there are cases where the tissue damage has progressed to a stage where repair cannot be predicted. The firming of loose teeth in their sockets is one of the spectacular effects of the rejuvenation, but obviously cases come to the veterinarians where pyorrhea has destroyed all peridontal tissue and repair of the injury is out of the question. The same applies to the dyspnea, to the circulatory disturbances and to the other symptoms. The pathological processes they signalize ultimately reach a stage

where they are irreversible. Then there is the genuine senile dog. Don't expect to rejuvenate the 18-year-old dog. It's not in the cards. However, sex hormone injection will make the declining months of some of these old fellows a good deal more comfortable and a good deal happier than they would be otherwise. A final pitfall in sex hormone therapy of premature senility is failure to impress upon the owner, that the cure will not be permanent and the animal will have to be returned from time to time for further treatment. The intervals between injections become longer as the injections are repeated. At first the dogs should be returned every three months; after a year or two one injection annually will be sufficient. A good many of these cases are lost track of after two or three years, probably, in some cases, because there is no further recurrence of the infirmities.

The number of cases of senility that I have treated in male dogs with hormone injections number about 100 and those in females a lesser number. They include house pets and hunters, such as beagles, pointers, setters and coon hounds. By chance good fortune, I am able to give some comparative data in the instance of the coon hounds that can't be shrugged off. In the cases other than the coon hounds, I have nothing with which to compare them, no controls and not even "before and after" photographs. It must suffice to say that my clients and I have been well satisfied with the results of this rejuvenation treatment, and the outcome was immeasurably better than in similar cases before I used the sex hormone treatment. In the case of the hounds I'll give the record. The reader may draw his own conclusions.

Case 1.—"Bill," a male coon hound, 11 years of age, weight 65 pounds, had sunken temples, eyes receding in their sockets and vision impaired from cataracts. He had an excellent reputation and formerly had been a consistent winner in races. In the past two years he had won only an occasional race and shown no interest in bitches in heat. During the past year he had been entered only in slow fields and had not won at all.

Bill was given 30cc of aqueous solution of whole ovarian substance, followed by three 20cc doses at 10-day intervals—a total of 90cc in a period of 40 days. His hair coat became glossy, his temples filled out, his eyes became bright.

Bill was entered in a fairly fast race. On the bidding there was no takers, but he came in winner.

At various intervals, but not on any regular schedule Bill was given injections of ovarian substance. He won more races and more money in 1946 than in any year in his prime.

Word of things like that get around no matter how close-mouthed a client may be.

Case 2.—Another coon hound owner purchased two outmoded favorites and brought them around to have them reconstituted into their old time form—into winners. They were given 30cc each of water soluble whole ovary substance; and four 20cc doses at 10-day intervals—a total of 110cc in 50 days. With meager conditioning they won several minor races and a few weeks later were entered in a fast field in which old Bill was also entered. In this race Bill came in second and these two dogs 4th and 5th places in a field of 11.

The rules of racing are strict and the competition severe. All three of these hounds had been valuable racing dogs, but had aged and deteriorated physically until they were definitely out of it. Two had been sold cheaply and old Bill had been retained chiefly in the hope he would sire some pups. Sex hormone therapy and no other treatment restored these hounds

to the speed and endurance of their prime. It constitutes an independent appraisal of the efficacy of the hormone treatment that is not easy to escape.

Chance perhaps plays a greater part in hunting contests than in racing but achievements in that sphere are a good test of speed, endurance, alertness intelligence and the possession of unimpaired faculties.

Case 3.—Three male coon hounds, aged 9, 10 and 12 years, had slipped badly in hunting coons. It was thought their days of competition were over. Their owner, however, could not quite bring himself to give up. They were started on 30cc of ovarian substance and continued for 90 days just prior to the hunting season on smaller doses with a minimum of 15cc.

All three hounds filled out like animals in their prime, developed glossy coats, keener vision, noticeably better heart action, and greater stamina. Imagine their owners gratifications when they secured 20% more coons in 60% of the time of their best previous seasons.

I regard this as a third impartial appraisal of the rejuvenating effect of the sex hormones in indicated cases. I have treated far worse cases of senile deterioration in other dogs with far more spectacular results, but no such criteria for measuring the results are available as is the case in racing or hunting in competitions. There has been no opportunity to apply the rejuvenating treatment to female coon hounds but other bitches have responded as readily to orchic substances as the males have to ovarian substance.

Desexualized animals respond to this treatment in a manner different from the response of entire animals. (1) They are more amenable to oral treatment and (2) like sex hormones should be used; i.e., ovarian substance in the spayed female and orchic substance in the castrated male. This latter possibly may be explained by the circumstance that after an animal is desexualized the transformation that occurs carries it nearer to the opposite sex than its original sex. In the spayed female both estrogen and diethylstilbestrol act about as happily as the water soluble ovarian substance and they are more readily available.

It is the writer's experience, in the use of opposite hormone therapy, that the large dosage has a definite influence, not to be obtained from doses of medium size. It upsets the already disturbed endocrine secretions, and usually results in restoration of complete balance. By repeated readjustments the return to balanced endocrine secretions brings relief from neoplasms, cardiac sclerosis, arteriosclerosis, asthma, cataracts, anemia, stiffness of joints, dry skin, kidney disturbance and liver dysfunction. The solidifying of the teeth usually occurs on the first treatment and remains indefinitely from a single injection. Neurosis or neurotic conditions are soothed. Sleeplessness and depraved appetites are restored. The skin becomes pliable and the hair coat sleek and glossy. The sexual capacity is restored and the digestion improved. That simply means—rejuvenation in any language.

Antivivisectionists Deceptive

These people [antivivisectionists] aren't at war with cruelty to animals. They are at war with science. They don't lift voices against gelding of cattle to make tender beef, against trapping and hunting or the branding of steers. The antivivisectionist lady sees no incongruity in wearing a mink coat—although dozens of animals were bitten by steel traps and froze to death in the Canadian wastelands to make that coat. They don't object to wearing feathers on their hats although those feathers were plucked from the tails of live birds. And they don't object to eating roast capon—although the chicken underwent painful surgery to provide a tender mouthful of food.—*Norman Kirk,* Surgeon General, U.S.A., quoted from *Hygeia.*

Control of Rabies

Preinfectional antirabic vaccination of dogs, when combined with other dog-control provisions, appears to be the most satisfactory method of assuring prompt recession of rabies. Now available are vaccines of superior potency, which can confer a high degree of immunity in a single subcutaneous injection of 5cc. To promote public coöoperation, vaccination of dogs should be performed free of charge. A voluntary program of canine vaccination in Massachusetts has freed that area from the disease for the first time since its introduction there in the eighteenth century. Alabama's experience with the program was similarly gratifying.

Annual vaccination of dogs is advisable until rabies has been eliminated from every state in the Union. While the disease prevails in a community it is important to recommend to the owners of cats that their pets be vaccinated by the three injection method. The bite of a rabid cat is frequently more dangerous than that of an infected dog.

Coöperation of the public is essential. To this end, an educational program which has the fullest support of the medical profession, and particularly the family physician, is urgently needed if the national control of rabies is to be successfully launched and the disease eventually vanquished.—KARL F. MEYER in *J. Am. Med. Assn.*, 133:12, p. 823. 1947.

Penicillin in the Treatment of Erysipelothrix Rhusiopathiae-Infected Turkeys

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ERYSIPELOTHRIX RHUSIOPATHIAE infection, more commonly known as swine erysipelas, is a very serious disease of turkeys which usually attacks maturing birds. It often makes its appearance in flocks just prior to marketing, at a time when the birds should have attained their maximum value. The first reported outbreak of the disease in turkeys in the United States occurred November 14, 1934, at Annandale, New Jersey[1] in a flock of 500 birds all of which were sick at the time of examination. There was a subsequent death loss of 200 in this flock. Since that time, there have been 39 recorded outbreaks in 12 states as follows:

State	No. of Outbreaks Reported
Colorado	4
Connecticut	3
Iowa	2
Massachusetts	3
Minnesota	1
Nebraska	1
New Jersey	1
New York	5
Oregon	16
Utah	1
Virginia	1
Washington	1

There have been additional verbal reports of outbreaks of this disease in turkey flocks of other states which are not included in the above list.

This disease, as it appears in turkeys, may be summarized briefly, as follows: Onset is sudden, the birds become debilitated and sleepy and may die within 48 to 72 hours or gradually recover. There is usually diarrhea with yellowish feces that contain copious amounts of urates. The snood, wattles, and other bare parts of the head and neck usually become swollen and cyanotic. Upon post-mortem examination, particularly in white turkeys, there may be generalized cyanosis. The blood vessels of the skin are injected. Ecchymoses and petechiae appear in the musculature, particularly of the breast and thigh. The bursa of the keel usually is filled with a serosanguineous material. The liver is generally swollen and dark and the spleen is congested. The kidneys appear swollen and injected; the ureters are filled with urates. The cloaca usually is filled with urates also.

Treatment of affected turkeys has not been entirely satisfactory. Reports on the use of specific serum in erysipelas-infected turkeys have not been encouraging, possibly for the reason that the birds have been sick too long before treatment is started.

Previous work in the laboratories of the Pathological Division confirmed the work reported by Drs. Heilman and Herrel[2] that the salts of penicillin were demonstrated to have a bacteristatic action on *E. rhusiopathiae in vitro* and *in vivo*. In addition, the present author[3] has demonstrated *in vitro* that these salts exert a germicidal action which varies according to the strain of *E. rhusiopathiae* on test.

In view of the foregoing, an experiment was projected to determine the action of penicillin on *E. rhusiopathiae*-infected turkeys.

Experimental Procedure and Results

A culture of *E. rhusiopathiae* (turkey strain No. M-17, which required 100 units of penicillin per cubic centimeter of a 24-hour broth culture to kill it within 24 hours) was passed serially through half-grown turkeys until 5cc amounts of a 24-hour broth transfer consistently killed the birds upon intrawattle inoculation. Our reason for selecting the wattles as a site of inoculation was the fact that introduction of therapeutic agents, particularly those suspended in oily or waxy bases, may be attended by retention of such agents in the tissues, thus rendering those tissues inedible for considerable periods. In some cases residues of the materials are still present even after two months. Throughout the experiment, unless otherwise stated, wattles were the site of inoculation for all materials whether for purposes of exposure or for therapeusis. This selection is of practical value from the field standpoint in that wattles are readily accessible, are of little edible value, and will readily accommodate large amounts of inoculum.

December 5, 1945, 162 three-quarter-grown turkeys were exposed, *via* the wattles, to 5cc amounts of transfers of the previously men-

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[1] Beaudette, F. R., and Hudson, C. B., Jr. An outbreak of acute swine erysipelas infection in Turkeys, *A.V.M.A.*, 88:4, N. S. 41:4, pp. 475-487. 1936.

[2] Proceedings of the Staff meetings of the Mayo Clinic, June 28, 1944.

[3] Grey, Charles G. Effects of penicillin on *Erysipelothrix rhusiopathiae* and on mice infected with that organism, *Vet. Med.*, 42:2, pp. 74-75. 1947.

tioned culture. Twenty-four hours later, prior to treatment, all of the turkeys were visibly ill. Treatment and results were as follows:

The first four groups of birds (10 birds in each group) received peanut oil suspensions of penicillin injected into the wattles. The penicillin was suspended in the oil at a concentration rate of 20,000 units in each cubic centimeter. One cubic centimeter constituted a dose. Each of the birds in group 1 received a single dose of the penicillin in oil. Groups 2, 3 and 4 received, respectively, 2, 3 and 4 doses of the penicillin in oil at 24-hour intervals. The percentage mortality of birds in groups 1, 2 and 3 was 70, 70 and 90, respectively. In group 4, however, there was an abrupt decrease in percentage mortality to 10.

In groups 5 and 6 (10 birds each) the same dosage rate of 1cc containing 20,000 units was used, but it was administered intramuscularly rather than into the wattles. The percentage mortality was 80 for group 5, which received one dose, and 50 for group 6, which received two doses 24 hours apart.

In groups 7, 8, 9 and 10 (10 birds each) an attempt was made to treat the birds orally. The dosage rate for each bird was maintained at 20,000 units. Two of the groups received the penicillin suspended in aluminum hydroxide whereas the other groups received it dissolved in 0.85% saline. There was no advantage in one menstrum over the other nor in two doses over one dose. The percentage mortality ranged between 80 and 90.

For purposes of comparison two groups of birds (10 each) were treated *via* the wattles with 10cc doses of swine erysipelas antiserum (equine origin). The first group received one dose of serum with a subsequent percentage mortality of 50, and the second group received two doses with a percentage mortality of 60.

Of 10 birds in group 13, only one would drink water that contained penicillin and this bird lived.

All of the 32 untreated, control birds died of the disease.

It appears, from the foregoing, that turkeys sick with *E. rhusiopathiae* infection may be saved if doses of 20,000 units of penicillin in oil are administered into the wattles at least four times at 24-hour intervals.

Bacteriological examination of the turkeys that survived treatment failed to reveal the presence of *E. rhusiopathiae* upon their release 41 days after treatment started, thus indicating a possibility that they may not be carriers of the disease after complete recovery has taken place.

It was considered desirable to repeat several of the preceding tests and also test several groups of turkeys with increased dosages of penicillin. Therefore, January 29, 1946, 60 three-quarter-grown turkeys were exposed *via* the wattles to 5cc amounts of a transfer of the same culture used in the preceding tests. Twenty-four hours later they were treated in the various ways and with the results shown in the following:

Group 1, consisting of 10 birds, was treated four times at 24-hour intervals in the same manner as group 4 of the preceding test. Again the percentage mortality was 10 as compared with 100 for the untreated control group.

In groups 2 and 3 of this test (10 birds each) an attempt was made, by increasing the amount of penicillin in each dose, to reduce handling of the turkeys to a minimum and induce greater recovery. In group 2, fair results were obtained by administering oil suspensions of penicillin in two treatments of 50,000 units each, 24 hours apart. The percentage mortality was 30 as compared with 60 for group 3, in which one dose of 100,000 units of penicillin was administered to each of 10 birds 24 hours after exposure.

In groups 4 and 5 (10 birds each) testing of swine erysipelas antiserum was repeated with a percentage mortality of 50 for each group. Group 4 birds received 10cc of serum in the wattles and group 5 birds received a second 10cc dose 24 hours later. There appears to be no advantage in using the second dose of serum.

Bacteriological examination was also made of the turkeys that survived this series of tests. All were free of *E. rhusiopathiae* upon their release 34 days after treatment was started.

In most field outbreaks of this disease in turkeys the toms rather than the hens appear to be most often affected. Toms and hens were distributed evenly throughout the experiments with the result that no sex-linked difference in susceptibility of turkeys to artificial exposure with *E. rhusiopathiae* was noted.

Summary

Erysipelothrix rhusiopathiae infection is a serious disease of turkeys usually observed in maturing birds just prior to marketing.

Swine erysipelas antiserum, as used in these experiments, administered early in the infection in one 10cc dose, reduced mortality to 50% when 100% of untreated control birds died.

Penicillin, suspended in oil and administered in doses of 20,000 units four times at 24-hour intervals, under the conditions of these experiments, reduced mortality to 10% when 100% of untreated control birds died.

Salmonellosis of Turkeys

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SALMONELLOSIS (paratyphoid) designates any disease which is caused by organisms belonging to the genus Salmonella. Two familiar diseases, fowl typhoid and pullorum, are examples, since both are caused by Salmonella (*S. gallinarum* and *S. pullorum*, respectively). A third member of the group, known as *S. typhimurium*, is next in importance, and surveys have shown that it causes over 50% of all outbreaks of salmonellosis other than pullorum disease and fowl typhoid. This article concerns only the types of salmonellosis other than pullorum disease and fowl typhoid.

There are over 150 known types of Salmonella, each of which can be distinguished from the other by laboratory tests. They cause intestinal disorders of many animals including man. In man, they are responsible for a high percentage of the so-called food poisoning outbreaks. In all animals, the young are more susceptible than the old, and this is particularly true in birds. Of the 150 types, at least 50 have been reported as the cause of enteritis in birds and 41 are known to have been responsible for losses in turkeys. Consequently, instead of a single disease there are at least 41 different paratyphoid infections of turkeys. This fact emphasizes the difficulties encountered in devising plans for preventing the infections.

As was stated in the foregoing, the salmonelloses in all animals, including birds, are characterized by enteritis. In poults the greatest losses occur during the first few weeks of life, and the symptoms are similar to those of pullorum disease. Diagnosis can be made only by laboratory procedures. The determination of the exact type of the organism is a problem for a Salmonella typing laboratory, because it takes special training and equipment to make these typing tests.

Mortality in outbreaks varies greatly. Survivors may become carriers and these adult carriers may be responsible for egg and hatchery transmission similar to that seen in pullorum disease. The danger of egg transmission varies with the type of the organism, since certain types are more apt to recur annually than others. *S. typhimurium* is an example of one which has apparently become established in turkeys and is of major importance because of egg transmission. Our studies indicate that some types may be transmitted to poults from sources other than eggs and cause heavy mortality, but leave no surviving carriers. These types are probably "native" to other animals and represent accidental or chance infections. It is because of such facts that it becomes necessary for diagnostic laboratories to get help from Salmonella typing centers to determine the types involved in each outbreak, if an intelligent control program is to be outlined to the grower.

Since there are many species of animals, including man, which may be carriers of the same Salmonella types that are causing turkey losses on a given ranch, there is always more danger of reinfection from these sources than is the case of pullorum disease. The program of prevention must, therefore, include a careful survey of such possibilities of transmission. There is increasing evidence that turkey herdsmen may be responsible for some outbreaks and, also, that hatchery help may establish the infection in hatcheries. We have one record where an outbreak occurred following the accidental use of sand litter recently removed from a cesspool that was being cleaned. This outbreak unquestionably was of human origin. It is equally true that persons, and especially children, may contract salmonellosis from contact with turkeys. This makes the problem one of public health significance and, in turn, complicates the situation. For example, *S. typhimurium*, which is one of the most important causes of salmonellosis in turkeys, is the type most frequently isolated from human outbreaks of food poisoning. It is also the most widely distributed type among most other animals.

Prevention and Control.—First of all, hatcheries must cooperate by doing everything they can to eliminate from their breeding programs flocks that are known to be carriers of any of the numerous types. The veterinarian can cooperate with the grower in this hatchery program by submitting, to a reliable diagnostic laboratory, poults from each hatch even if the losses are slight. If no paratyphoid infections are diagnosed during the season, the flock can be considered a fairly safe one to use for production of hatching eggs. If any of the numerous types of salmonellosis is diagnosed, the flock should not be used for production of hatching eggs for replacement of breeding flocks even though they are free of pullorum disease (Pullorum clean).

Sanitation in the hatchery and on the prem-

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ises of the turkey grower is even more necessary than in case of pullorum disease. Keeping turkeys segregated from all other farm animals is very important, since transmission from them to the turkeys is likely to occur if salmonellosis exists in the other livestock. Cats, dogs, hogs, sheep, rodents, reptiles and most birds must be considered potential carriers of Salmonella and should be kept out of the yards. Our recent studies show the need for eliminating snakes and lizards because of their potential transmission possibilities. On one ranch an outbreak of paratyphoid started in a brood of poults a few days after an infected garter snake was caught in the poult yard. The same type of Salmonella was isolated from both the snake and the poults. Flies caught in this brooder house six weeks after the poult losses started were also found to be infected with the same type of organism. This illustrates the need for fly control in brooders, and in hatcheries. It may even be desirable in some cases to determine if there are any carriers among the laborers (including the owner) that could be responsible for infection of the flock.

It is possible by means of the agglutination technic to determine if a flock is infected with any one of the paratyphoid organisms, but it is a complicated procedure to test for all the 41 types, since not a single test yet developed will detect all of them. The agglutination test for detection of the most common type of salmonellosis in turkeys is more complicated than the test for pullorum disease and, although feasible, under certain conditions, as an aid in an eradication program, it will never be feasible to guarantee flocks free from this or any of the other paratyphoid infections, because of the ubiquitous distribution of the organisms. This is in contrast to pullorum disease where there is little danger of spread from other animals.

Many manufacturers of biological products are promoting the use of bacterins for immunizing turkeys against salmonellosis. Most of these products contain only one or two of the 41 types of Salmonella, which have been reported from turkeys. The use of such bacterins, even if they were of value, would give protection only against the specific types (or at best, specific groups) used for making the bacterin, and the birds would still be susceptible to all the other types, or groups. Experiments made by the writer and colleagues under controlled conditions have demonstrated the futility of day-old vaccination of poults for *S. typhimurium* infection. Occasionally bacterins which are prepared improperly may be responsible for introduction of disease into a community. In one instance fowl typhoid caused an estimated loss of $100,000 in one area where the disease had not previously existed. This epidemic spread to nine turkey ranches and two chicken ranches the first year and has been endemic in the area since then. There is evidence that the disease was introduced into the community by the use of improperly prepared bacterins containing live organisms.

Recent reports by research workers (Mullen,[1] Clark,[2] Anderson,[3] and Pomeroy, Fenstermacher and Roepke[4]) indicate that sulfadiazine, sulfamerazine, and sulfamethazine have some value for reducing mortality from this group of diseases. The usual recommendation is the use of the drug at the rate of 0.25 to 0.5% in the mash for periods not exceeding one week. Pomeroy, *et al.*, called attention to the fact that the sulfa drugs are in general more toxic for poults than for chicks. Their results agree with findings at the California station (Hinshaw and McNeil,[5] McNeil and Hinshaw[6]). We found sulfathiazole to be distasteful to turkeys as well as toxic and that sulfamerazine at a 0.5% level in the mash cannot be given for longer than five days. It should be remembered when using sulfonamides for treatment of Salmonelloses that such treatment will not eliminate all of the carriers. They are not substitutes for testing programs or other methods of prevention.

Essentials for prevention of this group of diseases are: (1) elimination of known diseased flocks as sources of replacements for breeding flocks; (2) the use of separate hatching facilities for eggs for breeder flock replacement; (3) the frequent use of well-equipped diagnostic laboratories, which are manned by adequately trained diagnosticians, in order to discover new outbreaks which may endanger future replacement sources; (4) the recognition that there are numerous animal reservoirs of these diseases, which must be controlled to prevent transmission to turkeys; (5) fly control in hatcheries and brooders, and (6) the continual cooperation of growers, hatcheries, veterinarians and state agencies to aid breeders in securing replacements from salmonellosis-free sources.

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Experiences with DDT on a Turkey Ranch

Water emulsions of DDT were made, using two pounds and four pounds per 100 gallons of water of a wettable product containing 10% DDT in bentonite. A total of 150 gallons of the DDT suspension were used. Equivalent results were obtained with both dilutions. A compression bucket type hand sprayer was used to apply it; about five gallons were sufficient for 500 square feet. The emulsion was prepared by working up the chemical in a small amount of water, and gradually decanting this into a larger amount. It was then strained through cheesecloth in order to remove particles which might clog the sprayer. If these precautions are taken the material stays in an even suspension for several hours.

May 17, eight of the 10 rooms of a brooder house were thoroughly sprayed a few hours before the litter was put on the floor. The outside front and sides of the house which were black with fly specks were also sprayed, as well as a lane between two brooder houses. At this time the fly problem in the brooder houses, in the residence and on the paths was acute; both houseflies and blowflies as well as gnats, *Hippelates pusio*, were abundant.

The spraying was finished at 5:00 p.m. By 8:00 p.m. large number of flies in the brooder house were showing the nervous symptoms characteristic of DDT poisoning. The following morning the floors of the treated pens were covered with dead flies, but there were few, if any, live ones on the walls and rafters. In contrast the walls and rafters of the two untreated pens were covered with flies. There were also large numbers of dead and sick tule beetles and a few dead spiders. The two control pens were then sprayed also.

At noon of that day (May 18) poults were put in five of the pens, including one which had been sprayed only three hours before. No injurious effects were noted at any time in the poults, although they ate some of the flies which continued to fall from the ceiling into the feed and water. When the ranch was visited one week later there were no flies in the brooder house or on the outside walls. There was also an amazing reduction of flies on the sprayed area of ground in the lane between the houses.

This ranch was kept under constant supervision for several months. Four weeks after spraying there were still no live flies in the brooder house, although one noted occasional dead ones on the floor near the walls. At six weeks, no flies were noted in the air; nor on the walls or rafters, but some must have entered from time to time, since a few maggots were found in the droppings under the wire platforms. By August 1 (10½ weeks) control was no longer very effective. Some flies remained on the wall, and cobwebs, which had disappeared, were again abundant.

Results were apparent in the lane for three weeks. Constant walking along this path would, of course, remove much of the residual spray. The beneficial results obtained were probably due to the residue left on the weeds in the lane.

Two other trials were made on May 17. The fertilizer under one wire platform had not been removed recently, and maggots were abundant in certain spots. These areas were thoroughly sprayed with DDT, and left for three or four days. At the end of that time the fertilizer was removed, and maggots were present only in areas directly behind posts which had received insufficient amounts of the spray.

May 17, the back porch of the residence was also sprayed, both inside and out. Special attention was paid to areas on the outside walls where flies were roosting, as indicated by the abundance of fly specks. A week later the owner reported that there was no longer a fly problem in the house. This freedom from flies in the house lasted for a period of about one month.

From these results it is concluded that excellent control was obtained in the brooder house with no injurious results to the poults. It has been noted by other workers that water emulsions such as this, leave a better deposit than kerosene emulsions. Water emulsions are also safer to handle, since oily solutions apparently may be absorbed through the skin. There appeared to be no advantage in using four pounds per 100 gallons instead of two pounds for control in the brooder house. The amount used (five gallons per 500 square feet) deposits approximately 100mg of powder per square foot, the minimum amount usually considered necessary for control.

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Veterinary Contributions to BCG Vaccinatton

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THE vaccine, at present launched[1] against tuberculosis in this country is labeled BCG —from the initial letters of bacillus Calmette Guerin. Calmette being Director of the Pasteur Institute and Guerin, the research worker, who, through hundreds of transfers succeeded in attenuating a strain of *Mycobacterium tuberculosis,* isolated from a bovine source. Few persons, however, know that Guerin, the collaborator of Calmette during the years it took to attenuate the virulent strain and ever since associated with him in the vicissitudes of the experimentation until it was mature for use on man, is a veterinarian.

A first experiment, aimed at establishing in cattle, both the harmlessness of the 70th transfer and its protective power against the natural infection, was under way in 1915 when both men were still in Lille. Their work was brutally interrupted by the German Army which, when it invaded France up to the Marne in World War I, requisitioned the cattle in the territory.

After the end of the war, Calmette and Guerin were able to demonstrate in a classic experiment, reported in the Annales de l'Institut Pasteur in 1924, that the strain Nocard (Nocard also was a veterinarian engaged in research on tuberculosis) at the time it was handed in to them, was deadly for the bovine species, but through the 230 passages on bile media carried out by them in the course of 13 years was no longer pathogenic and cattle given the attenuated culture (now known as BCG) had become refractory to the intravenous injection of virulent tubercle bacilli of the bovine type. This experiment on cattle, started in 1921, paved the way to the premunition of human beings in France and later on, in several other European countries and in Central and South American countries.

In the reports which are being issued at present, the work, which was performed from 1924 to this date in the Po valley in Italy, is almost forgotten. Yet the support given to the BCG vaccination by the veterinarians and farmers in Lombardy and the Istituto Vaccinogeno Antituberculare (I.V.A.) founded in 1924 in Milan has been anything but negligible. The vaccination program had just been initiated, when an Austrian immunologist claimed that BCG was harmful since the characteristic lesions of tuberculosis, the tubercles, showed up in laboratory animals which were inoculated with BCG. The calves which had been inoculated on many farms in Lombardy, however, did not show any tubercular manifestations and on the contrary appeared to be in better health than the non-vaccinated control calves. The farmers who, at the suggestion of their veterinarians, donated their services and made this pioneer research possible, were willing to slaughter a few of the vaccinated calves. No tubercular lesions were found and the rumors, which threatened to defeat the use of the BCG were silenced. On the contrary, confidence in the new vaccine was strengthened by this episode. A report of many experiments on calves, goats, and swine, was published in book form at this time. (A. Ascoli: La Vaccination Antituberculeuse, 1928.)

More and more veterinarians and farmers and their associations became interested in the vaccinations. Members of the Veterinary College in Milan and the schools of Medicine in Milan and in the nearby Pavia were willing to supervise the experiments, which were being carried on with the unceasing willingness of the veterinarians and the farmers, to provide definite proof that the BCG is a specific prophylactic against bovine tuberculosis. The interest they showed is quite understandable since tuberculosis is one of the major scourges in the cattle of the Po valley. Eventually the farmers founded a national association for the fight against bovine tuberculosis, with branches in the provinces which suffered severe damage from the disease. The medical experts headed by the clinician of the University of Milan followed the experiments mainly with a view to drawing some conclusion as to the opportunity of intensifying the "premunition" in the human race.

Two more large scale experiments were concluded on calves donated by the farmers and raised at their expense in isolated stables which they put at the disposal of the commit-

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[1] Tuberculosis Control Issue No. 12, *Public Health Reports,* 62:6. 1947.

tee. The veterinarians of the zones were, as usual, eager to take care of the animals. The experiments were controlled by the committee and the results were published on the "Patologia Comparata della Tubercolosi" issue from 1935 to 1937 by the Instituto Vaccinogeno Antituberculare. These experiments demonstrated for the first time that BCG vaccination protected the calves not only against artificial inoculation with cultures of virulent tuberculosis organisms but also against natural exposure consisting of constant contact with tuberculous cattle.

At a meeting of experts, who convened on invitation of the League of Nations at the Pasteur Institute in 1928, the pioneer work accomplished in the Po Valley was rated as a main contribution to the studies concerning the value of BCG. But it was in 1930 at the International Veterinary Congress in London that the vaccination against tuberculosis got its accolade as a useful specific prophylactic. The problem was discussed in a general meeting of all the sections, and the reports of Guerin and the writer received the support of many leaders in the Congress, though the late Doctor Watson of Canada had reservations.

The meeting in Oslo, where the incident of Lübeck was redeemed by Neufeld, was decisive as to the continuation of the use of BCG in human beings. It may, however, be pointed out that the large experimentation due to the volunteer work of Italian veterinarians and to the unselfish cooperation of the Italian farmers supported the data available in the human field, which were presented by Calmette and substantiated in the reports on the vaccinations carried on in the other countries (Central America, Austria, Denmark, Germany, Hungary, Italy, Norway, South America, Sweden, etc.).

At present the debate which sometimes has been dramatic and even reached the climax of a tragedy seems to be closed.

BCG vaccination was not discontinued by the Italian farmers although the I.V.A. was officially closed due to political intrigues of the Fascist regime and their association was also doomed. Both the veterinarians and the farmers are launching a new drive, now that Italy is being restored.

It may be worth while to emphasize that the results of our largest experiment on cattle which lasted 13 years coincide strikingly with the results[2] on the Indians which were presented at the conferences held last September at the Tuberculosis Control Division of the U. S. Public Health Service in Washington, D. C., where it was decided to employ the BCG vaccination on human being on a large scale in this country.

In the course of its laboratory work (which came to an end in 1939 when the Fascist regime closed it, transferring production of the vaccine to an Animal Disease Station) the I.V.A. succeeded in preparing less attenuated strains which were tried as a means to reinforce the resistance conveyed by the weaker BCG. Fortunately these strains (I.V.A. 112, 114, 115) were not lost and may be of some avail in human beings too who do not respond to BCG.

Though the oral premunition of nurslings and their surveilance, which had been under way since 1926, was discontinued, the 15 years the Institute was in existence raised hopes that another goal, the cure of tuberculosis may be within reach.

Experimentation on calves, let us repeat, laid the foundation for the vaccination of babies against tuberculosis. Why should not experimentation on cattle be included in the research program from which the final evaluation is to be made of the new drugs (streptomycin and others) being studied in tuberculosis therapy?

The marvelous results which have been achieved by the collaboration of the veterinary profession in research on diseases transmitted from animals to man were highlighted in the conference held last March on the initiative of the New York Academy of Sciences. The relation of diseases in the lower animals (rabies, tuberculosis, anthrax, etc.) to human welfare, was discussed authoritatively by members of the veterinary profession. The report and the discussion on "Animal Tuberculosis and Its Relation to the Disease in Man" stressed the opportunity for more contributions from and closer cooperation in this field with the veterinary profession. It was suggested that the fundamental research on the value of new drugs, which so far had been established merely on artificially infected laboratory animals, should be supplemented by experiments on cattle, animals highly susceptible to natural tuberculosis infection. Even immunological problems concerning diseases, which do not affect any lower animal species, have been solved by veterinarians. The vaccination against diphtheria for instance is due to the research work of a member of the veterinary profession—Gaston Ramon. Thus one is led to conclude that only through the collaboration of the members of both the veterinary and medical profession can problems such as prophylaxis and therapy in tuberculosis be finally resolved.

[2] Tuberculosis Control Issue No. 4, *Public Health Reports*, 61:23. 1946.

Insect and Livestock Parasite Control*

By STANLEY GENTRY
Kansas City, Missouri

ONLY in the last few years have the livestock owners been able to obtain materials that are both practical and effective for external parasite control in their animals, and only the last two years, since the advent of DDT, has there been a satisfactory method to control flies on the farm, ranch and livestock.

Until a little over a year ago I was on the staff of the Livestock Sanitary Commissioner of Kansas, as Deputy Commissioner. At the request of Mr. Will J. Miller, Livestock Sanitary Commissioner, the state legislature appropriated a small fund to be used for the control of cattle grub and nodular worms in sheep. From this fund we purchased three small spray units to be used for the application of rotenone powder for the control of cattle grub. A cooperative program was arranged between our department, Doctor Kelley, Extension Entomologist, Kansas State College, Mr. Ray Cuff, Kansas City, Manager Southwestern District, National Livestock Loss Prevention Board and county agents in several counties in Kansas. We then contacted livestock owners in each of those counties, arranging for a demonstration in each area where the sprayer would operate. The sprayers being the property of the state, I was assigned to supervise their operation. This set up the program as a cooperative one between the state Livestock Sanitary Commissioner and the Extension service of Kansas State College.

The fund was not adequate to do gratis spraying, so a charge of 10c per animal was made for each treatment. This fee was too low. We had a loss of about $1200.00 for the season, or about 1.7 cents for each of the more than 70,000 cattle treated. It is my opinion that the fee charged the livestock owners contributed materially to the success of the venture. I doubt very much if the livestock owners would have responded as they did, had the service been free. From the three sprayers used in this small start, Kansas now has more than 200 spray units in operation. A veterinarian in North-Central Kansas owns six sprayers and keeps them busy during the entire year on fly, louse, grub and weed control.

One of a series of cattle grub demonstrations was in cooperation with the USDA, Bureau of Entomology. Doctor Laake, Senior Entomologist, Dallas, Texas, assisted in the conduct of these demonstrations. The results are part of the official records of his station. A small amount of technical grade DDT was released by the War Department early in 1945, to be used for fly control demonstrations in Kansas during the following summer. Before we started the demonstrations, we received a small amount of 50% DDT wettable powder. This material had not been tested on livestock and we submitted it to Doctor Laake for his approval. After his tests and approval, we started the demonstrations on June 11th, 1945. Through the efforts of Mr. Cuff and the Livestock Sanitary Commissioner, enough additional material was purchased to complete the tests on about 30 herds. The results of these tests have been widely publicized and are generally known. However, I will repeat some of the data. One rancher made 1200 steers available to use for this test. They were divided by gate cut, 600 to be treated and 600 controls. The two pastures were almost identical. The steers in one lot averaged 567 and in the other 569 pounds. They were treated twice during 60 days and at the end of this 60-day period, the treated steers had gained 18,000 pounds more than the control lot, or an additional one-half pound per steer per day. This was on pasture alone. That is not the end of the story. When they went to market the treated steers sold for 50c per hundred weight more than the untreated controls.

Another test was on a cow herd. I will mention only the gain on the calves. These cows and calves were cut into two groups, one in which the calves were dropped before March 1st and the other including calves dropped after that date and their dams. The calves in the older group averaged 212 and in the other 160 pounds when the test began. By the flip of a coin it was decided to treat the cows and calves in the young group; the older group to constitute the controls. This group was treated three times in a 96-day period. At the end of the test, the control lot calves weighed 408 pounds and the treated lot 429 pounds. Thus the calves in the treated group had gained 73 pounds more per calf in the 96-day period than the calves in the control group.

Another test which was not official because Doctor Laake had returned to Dallas and did not cooperate, was on two dairy herds belonging to neighbors.

In Dairy No. 1 there were three electric fly doors and the owner sprayed his cattle with a fly repellent four times each day—that is before and after each milking. Spraying his cattle and his dairy barn with DDT resulted in a gain of 8% in milk production.

No fly control measures had been employed

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*Presented at the 32nd annuarl meeting of the Interstate Veterinary Medical Association, Sioux City, Ia., Nov. 21-22, 1946.

in Dairy No. 2. The same treatment with DDT that was used in Dairy No. 1, resulted in a gain of 28% in milk production at this farm.

During the last year I have worked with Mr. Harry J. Boyts in the Sioux City area on grub, fly and louse control. Mr. Boyts works with the college of agriculture in each state, with veterinarians and county agents. This work was not in the form of tests, but demonstrations. Cattle grub demonstrations have included herds in Iowa, South Dakota and Nebraska.

Comments on Demonstrations

Warble Fly.—In this area I'm sure that both species of the warble fly—*Hypoderma lineata* and *Hypoderma bovis*—are present, *i.e.*, the common heel fly and the bomb fly or northern species. There is very little difference in the operation of the grub in these two species, but considerable difference in the behavior of the flies. The heel fly is a sneak. It tries to lay its eggs without the cattle knowing it is near, but is successful only a small part of the time. The bomb fly is a noisy fellow. It comes in with a loud buzzing like a dive bomber, lays its egg, is gone to return for another attack. This fly is apparently active from early spring until about July 1st. DDT is not effective in the control of warble flies.

The grub in this area will start to appear early in February and continue until about June. The long season is due to the grub caused by the bomb fly. I noticed last summer that the cattle were still running from the fly late in June. The heel fly is common to most of the United States, while the bomb fly is active only in the northern states; being found in the northwestern part of Nebraska and in most of the states north of an east-west line just north of Omaha.

The bomb fly, as I mentioned before, attacks the cattle with a lot of buzz and fuss. The method of his approach excites the cattle, causing them to run with no particular goal in sight except to escape. Weight loss from this source is very great.

Horn Fly.—The application of DDT controlled horn flies in this area for approximately three weeks after the first treatment.

Lice.—In recent tests we used benzene hexachloride (B-H-C) for louse control. Tests to date show that B-H-C destroys lice eggs in addition to killing the louse. B-H-C is 100 times more toxic to certain insects than DDT. Although it has a slight odor, I do not find it objectionable or annoying. Reports on these louse demonstrations are not yet available.

Veterinarians from their contacts with livestock men and farmers know that one of their greatest problems is insect and parasite depredations. In the past, livestock men have accepted them as one of the many hazards encountered in the normal process of producing meat. Stockmen have known for years that the heel fly and the bomb fly chased their cattle in the spring and early summer; causing loss of weight, reduced milk production, even loss of life in mature cattle and, too often, serious loss of unborn young.

Just about the time the warble flies are through annoying herds, the horn fly appears. This pest will cause cattle to bunch (generally on some high spot and usually far from water) crowd and shove each other around, for hours and hours each day. If it is a cow herd, the baby calves are on the outside of the crowd and are lucky if they get to feed between 10:00 a.m. and 4:00 p.m.

Another pest is the stable fly. He is a definite problem in this area. Control of the stable fly is far more difficult than that of the horn fly, because the sanitary problem is such a great factor.

After the fly season is over the louse problem appears and livestock men watch their cattle rub on anything that can be found. In some cases, in trying to dislodge the firmly attached lice the hair and the outer skin are rubbed off. I believe the blood sucking lice (I'm speaking of both the long nosed and the short nosed blue louse) cause more loss in dollars and cents than any other parasite. Why? Because they attack the cattle when they are in the feed lot being fed high priced grains and concentrates. The infested cattle instead of resting and putting on weight, spend their time in trying to rub off the lice.

Livestock men have remarked that the material used to spray cattle surely made them have a fine coat of hair. I don't believe that the material has anything to do with the condition of the hair. I contend that when cattle are doing well they are sure to have a normal coat of hair.

Insect and Parasite Control

Successful control of insects and parasites depends upon the use of the proper materials and the correct measures for the job in hand. Let's take a look at the different materials and methods of application.

Horn Fly.—This fly lives on the cattle, never leaving them except to lay eggs. Enough of the larvae live over the winter season concealed in or beneath the droppings of the cattle to start a new crop each summer. These flies feed about three days before they mate. When the cow defecates the female lays her eggs in the fresh droppings. From egg to fly requires 10 to 14 days. The life cycle of this fly and his habits make it easy to control. An

application of 0.25% DDT will kill the horn fly on the cattle for about two weeks after first treatment; three weeks after the second treatment, and four weeks after third and such subsequent treatments as may be necessary, depending on the length of the fly season.

It is important to use a sprayer with high pressure, 500 to 600 pounds at the gauge. For successful control the DDT particles must be forced down to the hide. Misting on the outside of hair coat is effective for only two or three days.

DDT dust is not effective for fly control. Tests indicate that it loses its potency in approximately 36 hours.

We recommend the use of 50% DDT wettable powder. Four pounds to 100 gallons of water make a 0.25% solution. DDT in powder form is insoluble in water, therefore when cattle are being dipped the dip should be stirred if the tank is out of use for 30 minutes or longer. This can be done with a bucket on a rope, pumping the water up from the bottom of the tank. We do not recommend that emulsion be used for dipping, because of the hazards. Emulsions are safe only if they are thoroughly mixed before spraying or dipping is started. Failure to get the emulsion thoroughly mixed has caused serious loss to several livestock owners.

The dipping tank should be of sufficient depth to submerge the cattle, with about a 16 to 20 feet of swim. Let the cattle stand in the drip pen long enough for the excess dip to drain off the hair. DDT applied in this manner will not be affected by rain if the cattle have been treated or dipped as long as 30 minutes before it rains.

Five per cent solutions of DDT in oil have no place in the spraying of livestock. This preparation is suitable only for buildings. When applied to unfinished wood much of its effect is lost because the oil penetrates into the wood, where the DDT remains.

Stable Fly.—This is a tough customer. DDT sprayed on the animal is not very effective. It may kill some of the flies, but I doubt if they are seriously handicapped by its application. A cleaning up of their breeding places is the most important step in the control of this fly. The stable fly likes nothing better than an old feed rack, with a layer of rotted hay or straw in the bottom, or an old manure pile for his breeding ground. Where one sees a lot of stable flies, a search for rotted hay or straw or the common manure pile is in order. Take a stick, stir it up and see the little brown shells, or perhaps they are still in the maggot stage. Control is very satisfactory if proper sanitation is practiced. When breeding places are eliminated spray the inside of all buildings where flies rest, with 2.5% DDT wettable powder mixtures, or a 5% DDT in oil. Note the solution in oil must be stronger than the suspension in water. In the latter the powder stays on the surface while the oil solution soaks into the wood and much of the DDT is buried below the surface where it does no good.

Horsefly.—DDT has little, if any, value for the control of the tabanids, horse flies, and no value in the control of the bot flies. Oestrus and Gastrophilus. We do not recommend the application of DDT or other spray materials with sprayers, to horses because of the danger of physical injury to both the operator and the horse. It has been my experience that horses when sprayed become very excited and may break their halters and go through almost any fence. Even though DDT be applied to horses it is effective for only about three days —perhaps because horses sweat freely.

Lice.—DDT is a specific for hog and cattle lice—0.25% for hog lice and 0.5% for cattle lice. It is claimed that one application of DDT at this strength will give complete control, provided all parts of the animal are wet with the mixture.

Mosquitoes.—DDT spray or dipping treatment is excellent for mosquito control.

Grub Control.—Cattle grub or warble control is very successful by two methods—either dusting or spraying. If dust is used, apply to the area affected a mixture of two parts of Tripoli earth and one part of 5% rotenone powder. For spraying use 7.5 pounds of 5% rotenone powder to each 100 gallons of water. If the sprayer is used, apply with a pressure of at least 400 pounds—600 pounds is preferable. This of course is to force the material under the scab that covers the grub opening and into cavity to contact the larva. It is my opinion that due to the fact that both types of warble flies occur in his area, it will require four or five sprayings between February and June to control the cattle grub effectively.

Benzene Hexachloride.—This is a new product in the insect and parasite control field. It apparently does not have the residual effect of DDT, so it is not recommended for flies. One application of B-H-C will kill cattle lice, and destroy the egg—provided the entire animal is thoroughly wet. It will not kill grubs. Gammexane is a gamma isomer of benzene hexachloride.

2-4-D.—A new weed killer, 2-4-D, has been used quite extensively in several states to control weeds along the highways, in the cultivated fields and in both tame and wild grass pastures. Experiments conducted by the USDA Research Center at Beltsville, Maryland, show that pastures sprayed with 2-4-D to kill weeds, are not injurious to live stock.

Changes Following Nonfatal Hemorrhage in Dogs

An understanding of the condition resulting from acute blood loss is of great importance in the management of medical and surgical patients. During recent years renewed interest has become manifest in this subject. Formerly attention was directed principally at the restoration of blood cells and hemoglobin following acute hemorrhage. However, recent studies indicate that restoration of plasma volume and of the total circulating plasma proteins are equally, if not more, important phenomena than the restoration of blood cells and hemoglobin, since these processes help to re-establish the hemodynamics of the peripheral circulation and make it possible for any hemoglobin that may remain, to carry out its function of transporting oxygen to the tissues.

The results of studies dealing with experimental hypoproteinemia and plasma protein regeneration suggest that there may be a marked difference in the recovery of normal and hypoprotenemic subjects from an acute hemorrhage. Thus, if attention is limited to the changes of the plasma volume and the plasma protein concentration, which have been found to occur following a single nonfatal hemorrhage in normal dogs (and man), it would appear that there is a prompt, but gradual, inflow of fluid and plasma protein from the tissues into the general circulation. The initial increase of plasma volume is apparently a result of the addition of fluid which is relatively low in protein. In from several hours to some 70 hours after severe hemorrhage the plasma volume may be found to exceed the control level. In general, it has been found that the plasma protein (albumin) is restored more slowly than the plasma volume and may be still incomplete at the end of several days. Since there is evidence that after hemorrhage the blood volume is not restored to normal until new plasma protein has been added to the circulation, a study was carried out (Western Reserve University) in order to compare the spontaneous recovery of normal and hypoproteinemic animals from a single, severe, nonfatal hemorrhage.

Young adult dogs were used in this study and were placed on a constant diet (Purina Dog Chow) for at least seven days before the experiments were undertaken. Hypoproteinemia was then induced in one group by feeding a diet low in protein for four weeks.

The animals were bled 25% of the measured blood volume (estimated from the plasma volume and the hematocrit) without anesthesia, by direct puncture of the femoral artery. Food was withheld for the 24 hours preceding the bleeding, and no food or water was allowed for 24 hours after which time the dogs were again put on their regular diets.

The data reported, on the average blood changes which were encountered, offers further support to the findings of other investigators that following a single, nonfatal hemorrhage in normal dogs there is a prompt, but gradual, restoration of the plasma volume and of the total amount of circulating plasma protein. In the present study no nitrogen or fluid replacement (orally or intravenously) was instituted for a period of 24 hours after the hemorrhage. During a four-hour interval, in normal dogs, the plasma was found to have regained, on the average, 60% of the volume, 24% of the total plasma protein, and 26% of the plasma albumin lost by hemorrhage. Similarly, during a 24-hour period the plasma was found to have regained 94% of the volume, 74% of the total plasma protein, and 83% of the plasma albumin lost by bleeding. These figures support the view that the initial increase in plasma volume is due to the addition of fluid relatively low in protein and that albumin and globulin are restored at approximately the same rate.

The data obtained with the hypoproteinemic dogs, which were studied in identically the same manner as were the normal dogs, are of some interest. Despite a state of protein depletion, as evidenced by the reduced control plasma albumin concentration, the plasma regained during a four-hour period was on the average, 60% of the volume, 21% of the total protein, and 37% of the albumin lost by the hemorrhage. During a 24-hour period, the plasma regained, on the average, 76% of the volume, 43% of the total protein, and 54% of the albumin lost. Whereas, on the average, the plasma volume was completely restored during a succeeding period of several days when the animals were allowed the low protein diet, the plasma protein restoration remained incomplete. The source of the protein which apparently was added to the plasma is not clear.

No report is given, and apparently no records were made of the frequency or volume of urination. Inasmuch as food was withheld for 48 hours and water for 24 hours it is obvious that the excretion of urine was decreased. With the hemorrhage, circulation may have failed to the extent of reducing the pressure within the glomerulus of the kidney (which occurs in shock) to such a level as to be insufficient for filtration.—*H. J. Mostyn.*

Veterinary Practice—IX

Obstetrics

By E. T. BAKER
Moscow, Idaho

WE used to have a dozen or so equine obstetrical cases every spring, which occasioned some pretty strenuous hours. However, of late years, most of our obstetric work has been with dairy cows.

Small animals and swine really come under hospital care, for they take so long to expel their litters that a general country practitioner cannot give them the time needed.

We have discussed in detail in previous articles our routine in handling difficult calving cases, but a brief review will do no harm. Strange to say, we like this type of work, and this is probably due to our success with it. The latter statement is not boastfully made, since the success is due to several things other than skill on our part.

In the first place, we have impressed upon our clients for the last three decades the value of prompt veterinary aid. Hence, most of our cases are not too difficult. In summer, a heifer may be found in a distant pasture trying to calve, and some of these are extremely difficult to handle. In possibly one out of ten cases the fetus may be dead and sometimes greatly bloated and the young mother so far gone that heroic treatment is necessary. A dead fetus occurs more often in summer, when the animals are out on pasture and in young heifers, not usually brought in with the milk cows.

In the second place, we have learned the hard way, how to handle these cases, with a minimum of exertion, by using good equipment and all the various little "wrinkles" picked up in taking care of several thousand cases.

In the third place, we have learned the value of good clothing, and the importance of a favorable position of the patient.

And finally, we have learned the value of milk fever treatment in practically all of these cases. It is helpful in preventing eversions, and in bringing the apparently moribund back from the brink.

Requirements

We warm a 500cc and a 250cc bottle of calcium gluconate such as are used in milk fever. If the cow be small, we administer 500cc of the combined solutions in the shoulder and 20 or 30cc sterile camphorated oil. In case of a large animal, we give the entire 750, and about 50cc camphorated oil.

We also carry along a gallon bottle of warm water, as well as a 10-quart aluminum bucket.

Our instruments are carried in a large case, consisting of wire stretcher, chains, handles, halter chains and snaps, snare, blunt and sharp hooks, and a repeller. However, most of the time, we use an old pitchfork handle which can be dipped in antiseptic.

Very important is a big rope halter, and lariat. Many of our cases are out in a field far from stanchions or box stalls, so we must be prepared for anything.

We use aromatic antiseptics, and have very little trouble in keeping fairly clean.

If the patient is a beef animal and shows signs of eclampsia, or becomes wild eyed and woolly, we slip her a capsule of equal parts of powdered gum acacia and chloral. By having her securely restrained before she becomes "owly-eyed," all these requirements in muscular exertion and profanity are greatly lessened.

Clothing

When we receive a call to see a cow "tryin' to calve," we change clothes at home. We put on a pair of old trousers; pull down the right sleeve of our union suit, and slip on an old sleeveless shirt. Over this we put on our rubber obstetrical suit, and then our four-buckle high tops. With an old cap, and mackinaw in cold weather, we are ready for anything.

Delayed Parturition

Where parturition seems imminent and the animal is not straining and there are no apparent symptoms of malposition of the fetus, we merely give the patient 500cc of calcium gluconate and dextrose in the shoulder. We do not like to administer an intravenous injection in such cases for, if anything happens to the patient within the next six months, it will be blamed on "that there dope Doc shot in her neck."

Usually these cases happen about dark but we treat them as described and then go home. Almost invariably the owner calls up the next morning and tells us the cow has a lively little calf and seems to be "doin' all right."

In these cases of delayed parturition take things easy and give Nature a chance by assisting her and not trying to force the issue. In about nine times out of ten the termination will be satisfactory. If later manual delivery becomes necessary no harm has been done by a reasonable amount of wishful waiting.

Position of a Patient

If manual delivery is undertaken or foreseen, keep the animal on her feet if possible. If she does fall down, have her hind quarters slightly elevated.

Actual Operation

With everything in readiness, such as medicine administered; animal restrained and in a good position; wire stretchers attached to a post or tree by means of extra halter chains, we are now ready to make an examination. Perhaps these preliminaries have taken altogether 10 or 15 minutes, but it is time well spent.

Dipping our hands in the warm and soapy antiseptic, we try to determine just what is keeping the little stranger from entering a new world.

"How's it comin', Doc?" queries the owner.

Now, unless I can feel the head or tail, I answer that it is impossible to determine, because things are so mixed up. Even if we only find one little teensy-weensy foot turned back, and the presentation is otherwise normal, we do not tear our arm off at the shoulder trying to remove it immediately, if not sooner. There is a time for all things, as the Scripture informs us, and this is one of them.

We pause to take a rest. This impresses the client with the mighty physical efforts yet to come.

Then we resume, and attach chains to the feet, if possible. As we raise up the head, the owner or hired man or Uncle Pete do the heavy work on the handles. We think it is a distinct honor and privilege to allow them to supply most of the "traction," as we scientists say. Regrettably, we sometimes have to supply it when the owner happens to be sickly or a cripple, but this is not often.

Now then, comes the secret of delivering a live calf if it was that way when it started. By having everything ready, no delay holds the calf in the maternal canal until it suffocates. When the head or hips are out, we show more real activity for about two minutes than a bird dog in a covey of quail.

Of course, if the fetus is very dead, we may perform embryotomy and bring it out minus its running gears. If a monstrosity, which is not common, then the case becomes a problem that must be solved as conditions warrant.

Complications may set in, but with the milk fever treatment already administered, these are few and far between in our practice.

Eversions usually follow long and strenuous labor, with the patient's hindquarters down hill. Severe straining gives a hint of this oncoming event, and a change of position and chloral may help to prevent it.

After Treatment

This consists in giving the cow some grain and, in winter, a warm box stall. We seldom attempt to remove the afterbirth, as the gluconate seems to attend to this in a few hours.

As the owner exclaims: "Goddlemighty Doc, ain't that calf a whale?" we put back our instruments, remove our rubber suit and leave him some tonic powder to place in the grain.

Then when the owner asks: "How much, Doc?" and we reply, and he makes out a check, the transaction may be considered another adventure in practice with the scientific expert properly compensated.

(To be continued)

This cow was in a poor position for an attempt at delivery. However, the doctor persuaded her to get up and so was enabled to proceed

Clinical Reports

Extra Uterine Fetus

July 10, 1946, a particolored female cat was presented for euthanasia. Very little history was received, except the casual remark of the owner that the animal was old and a continual nuisance because of the number of kittens she produced.

It was quite evident the cat was in the advanced stage of pregnancy. After a suggestion, permission was obtained from the owner to perform a cesarean section and spay her with the idea in mind of finding her a suitable home.

Since the kittens were not wanted, pentobarbital sodium was chosen for anesthesia. The incision was made through the mid-line and four, apparently normal, full-term kittens delivered. It was necessary to make two incisions into the uterus because of a slight misplacement of the first and they were closed with a double row of Connell sutures of chromic catgut. The muscle and peritoneum were closed with interrupted sutures of catgut and the skin with interrupted sutures of nylon.

The patient made an uneventful recovery from the operation, but three days later a physical examination revealed an abnormal enlargement in the abdomen. It was at first feared that a fetus had been overlooked in one horn of the uterus. By palpation through the abdominal wall this enlargement was judged to be of about the size of a small hen egg.

Failing to diagnose the condition accurately, euthanasia was performed. A post-mortem examination showed complete involution of the uterus and good healing of the uterine incisions. The enlargement was found in the great omentum approximately an inch below the spleen. Because of its almost black color it closely resembled a melanoma. The tough fibrous capsule of the enlargement was incised and a particolored fetus removed. Because of the closely enveloping capsule the fetus was tightly doubled upon itself, but was readily straightened out. When straightened the fetus measured four inches in length and weighed, including the surrounding capsule, 26 grams. The hair coat was white, black and tan. Claws, hair coat and general anatomical structures were well defined but features about the head were not.

From available literature it must be assumed that this was a case of rupture of the uterus earlier in gestation followed by a walling-off process of a fetus which then became a foreign body in the peritoneal cavity. There was, however, no evidence of adhesions in the abdominal cavity to indicate rupture of the uterus and consequent attempts by the natural methods of healing to mend the damage. Nor was there any evidence of the fetal membranes of this fetus either in the uterus, the peritoneal cavity or the capsule then enveloping the fetus. There must have been complete absorption of these membranes following the escape of the fetus from the gravid uterus.

An accurate diagnosis could have been arrived at by use of the X-ray or an exploratory laparotomy. The condition could have been corrected easily by surgical removal. It was the incorrect diagnosis due to inadequate examination that led us astray.

WILLIAM PRICE

Pittsburg, Kan.

Atypical Lesions of Blackleg

A hereford steer, seven months of age, was presented for treatment with the following history: Two calves, of approximately the same age as this one were found dead that morning and this calf showed depression and anorexia. All three of the calves were good hereford grades, still nursing the cows and thrifty.

The animal was in fine condition, but showed great prostration. All visible mucous membranes were anemic. The temperature was 108° F. It would arise and move about when prodded, but would soon resume sternal recumbency. No difficult motivation or stiffness could be observed. There were no evidences of wounds nor visible swellings nor crepitant areas.

The sick calf was given 100cc of blackleg antiserum, one ounce of sulfanilamide *per os*, and 50,000 units of penicillin, intramuscularly. A post-mortem examination of the two dead calves revealed, with the exception of a subcutaneous gelatinous material, no characteristic blackleg lesions.

The calf died the next morning and a post-mortem examination was made immediately. Typical blackleg lesions were found in the gluteal region of both legs, and in the pectoral and cervical region. In addition there was involvement of the tongue and heart. The tongue was approximately one and one-half times the normal size. The musculature was a dirty brown color and contained a bloody fluid. The myocardium showed the same dirty brown color and contained a smaller amount of bloody fluid. There were no other marked lesions, other than a hemorrhagic lymphadenitis.

The next day the owner brought in a fourth calf showing symptoms identical to those of the other animal. It was given 100cc of black-

leg antiserum and 50cc of 20% dextrose solution intravenously. It died the next morning and a post-mortem examination was made. Typical blackleg lesions were found in both hind legs, the ventral portion of the abdomen, both front legs, and in the pectoral and cervical muscles. No lesions were found in the heart or tongue.

This was an instance in which one might easily go astray in making a diagnosis, with possibility of considerable loss resulting in a large herd. The lesions in carcasses of the first two calves that died did not suggest blackleg, nor did the symptoms of the two calves that were seen before they died show the characteristic lameness and crepitant areas usually associated with blackleg. It was only persistence in continuing to hold necropsies that enabled us to make a correct diagnosis.

J. W. BARRY, JR.

Kansas City, Kan.

Photosensitization in Cattle

The owner of the cow shown in figure 1 distrusted his neighbors and was quite convinced a solution of lye had been thrown on her back.

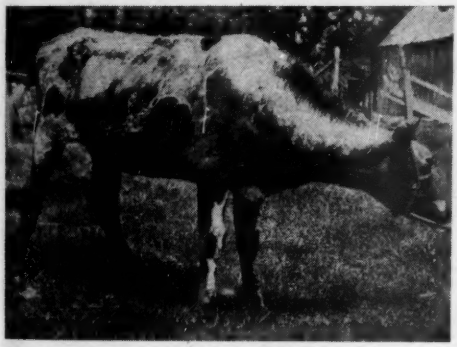


Fig. 1. The owner thought a neighbor had thrown lye on the cow

This was the only animal affected in a herd of 16 that was pastured in the woods shown in the background.

The entire upper half of the body and the escutcheon was affected. In large areas on the ribs, the hams and the escutcheon the skin and underlying tissue had sloughed completely leaving the bare muscles exposed.

The cow was kept in the barn from sunrise to sunset and fed second cutting alfalfa hay. She was turned out at night for exercise and to graze. Two months later recovery was complete. She was marketed, in good flesh, after five months.

The cow shown in figure 2, a light strawberry roan, was pastured a mile from the homestead and had not been seen for a week, when she was brought to the barn, in the condition shown in the illustration, one morning after an electrical storm.

The owner reported the cow to his insurance

Fig. 2. The owner thought this cow had been struck by lightning

company as a possible lightning casualty. I examined her for the insurance company and made a diagnosis of photosensitization.

For a period of three months, this cow was kept in the barn and fed second cutting alfalfa during the daytime and turned out on bluegrass pasture at night. By that time she was fat and had a good hair coat of natural color.

FRED M. MAXFIELD

Gilman, Ia.

Degeneration of the Optic Papillae

History.—The subject of this report was a very valuable, six-year-old, liver-and-white, female pointer. The owner bought the dog in Kentucky shortly before he brought it to the clinic for a physical examination.

Symptoms.—The day the animal came in was sunny and bright. In spite of that, the pupils were widely dilated, a disease condition in the eye was suspected. Immediately, bright artificial light (ophthalmoscope) was then used, and mydriasis was still observed.

The animal was taken into a dark room and with the aid of an ophthalmoscope, the eye was examined thoroughly. It was noticed that the discs (optic papillae) were grayish white in color and their margins were very irregular. The left eye was the more affected. The normal optic papillae are round and smooth. Except for this pathologic condition in the eye, and whipworm *(Trichuris vulpis)* infestation, nothing wrong with the animal could be observed. There was no apparent blindness.

Diagnosis.—According to medical ophthalmologists, degeneration of the optic nerve can

be classified into (1) simple, primary, non-inflammatory atrophy and (2) secondary, inflammatory atrophy.

If we follow the same nomenclature in veterinary medicine we shall be inclined to consider this case as a secondary atrophy. This is based primarily on the irregularity of the margin of the optic papillae, which is quite characteristic in such conditions.

Etiology.—Various causes such as cerebrospinal diseases, certain poisons (lead, alcohol), heredity, trauma, embolism and thrombosis of the central artery of the optic nerve, and many others, have been claimed to be responsible for degeneration of the optic papillae. Due to the lack of history, no circumstantial evidence could be discovered to support any specific cause in this case. No correlation can be established between the eye condition and the Trichuris infestation.

Course and Prognosis.—Usually the course is slow. The prognosis made in this case was unfavorable since in this condition the symptoms tend to progress and will probably end in complete blindness.

Treatment.—Under such conditions treatment consists in attempting to control the cause and prevent the progress of the disease. Since it was impossible to determine the cause, no therapy was attempted. Very little can be done for the atrophy itself. The owner was informed that the dog will eventually become blind.

ROSENDO CORDERO

Humacao, Puerto Rico.

* * * *

Unusual Case of Amputation of a Digit in a Bull

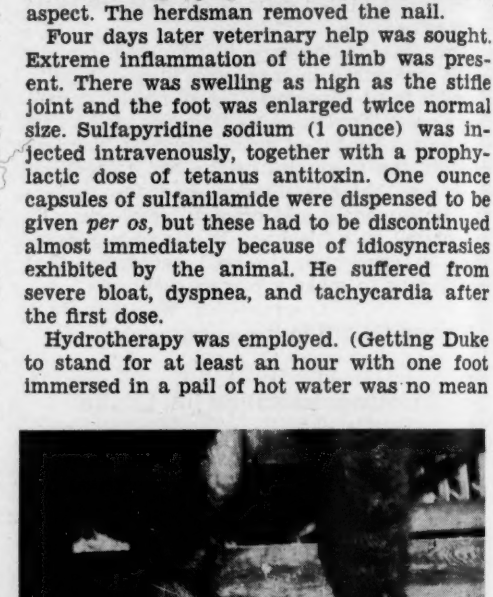
Amputation of a digit or rather of the ungual phalanx of a toe in cattle is frequently indicated when infection invades either the coffin or pastern joints producing a suppurative arthritis which is resistant to external treatment. Such is the case in advanced cases of infectious pododermatitis. If the infected digit is not removed lameness and inflammation of the tissues may persist for months with little if any tendency toward healing being shown. On the contrary the infection may extend up the leg and necessitate amputation of the medial or even the proximal phalanx. Although the operation is one commonly performed in veterinary practice, the case here described is unusual because of the type of animal involved, the nature of the injury and the more or less uneventful recovery which followed the operation.

The patient was "Duke," a valuable, registered shorthorn bull. He is a fine "typey" specimen of his breed and begets exceptionally good calves.

One day in the late winter of 1945-46, the herdsman noticed that the bull was extremely lame in the left hind leg. Examination of the foot revealed a four penny nail about two inches long which had penetrated the sole of the medial digit, perpendicularly, near its axial aspect. The herdsman removed the nail.

Four days later veterinary help was sought. Extreme inflammation of the limb was present. There was swelling as high as the stifle joint and the foot was enlarged twice normal size. Sulfapyridine sodium (1 ounce) was injected intravenously, together with a prophylactic dose of tetanus antitoxin. One ounce capsules of sulfanilamide were dispensed to be given *per os*, but these had to be discontinued almost immediately because of idiosyncrasies exhibited by the animal. He suffered from severe bloat, dyspnea, and tachycardia after the first dose.

Hydrotherapy was employed. (Getting Duke to stand for at least an hour with one foot immersed in a pail of hot water was no mean



This 1750-pound bull walked as well on one toe as on two

task.) During the first two weeks this was done twice daily; for the next four days at least once daily. The hydrotherapy, with accompanying massage, helped to localize the inflammation distal to the fetlock joint. Here a series of multiple abscesses developed, which were lanced, drained and dressed with either BIPP or a suspension of sulfanilamide powder in either mineral oil or camphor-phenol antiseptic. Although amputation was indicated, every effort was being made to avoid the operation because of the value of the animal.

Duke had weighed 1950 pounds. He now weighed about 1600. He was unable to bear any weight on the affected limb, let alone

accomplish natural service. It was feared that even if the operation were successful in remedying the condition he would still be unable to mount and serve cows because of the great weight which is necessarily borne by the hind legs during coitus. Finally, since no progress was being made by palliative treatment, amputation was performed.

Duke was cast on his left side using two half hitches—one around his abdomen, the other about the thorax just behind the front legs. In this position, the medial digit was presented dorsally. The right limb was drawn forward; the left extended posteriorly. Both legs were fixed in their respective positions using lariat ropes. A rubber hose tourniquet was fastened about the leg just proximal to the fetlock joint. These details are mentioned because the size and strength of the animal lent interest and respect to each of them.

The operative area was washed with soap and water, shaved and rendered as aseptic as possible with alcoholic sublimate 1:1000. The animal was anesthetized by infiltration with 3% procaine hydrochloride administered subcutaneously. Perpendicular incisions were made on the dorsal and plantar aspects of the limb starting just below the dew claw. They connected with another incision which girdled the digit just about the coronary band. The skin flap thus formed on the medial aspect of the limb was dissected away from the phalanges as far as the middle of the first phalanx. The affected bones were amputated by cutting through the middle of the first phalanx. The area was packed with BIPP impregnated gauze and sutures were placed along the lines of incision, allowance being made for drainage and removal of the dressing.

Examination of the tissue which had been removed revealed a purulent arthritis of the coffin joint with accompanying osteitis of the third phalanx and the distal two-thirds of the second.

After care consisted of dressing and application of BIPP every other day. The sutures were removed in 10 days and the area treated as an open wound, using sulfanilamide suspension which was held tightly in place by bandages. Recovery was uneventful and healing occurred by second intention with a minimum of scar tissue.

Duke was still somewhat lame but by six weeks after the operation he no longer favored the limb and appeared to bear full weight on it. The herdsman was advised to keep his weight down, so that liability of his "breaking down" in the hind quarter would be reduced. Three months after the operation, he was turned out to pasture with a herd of cows all of which he served during the breeding season.

Today, nearly a year after the operation, Duke gets around as well as any other bull of his size. He now weighs about 1750 pounds and shows no tendency whatsoever toward lameness or even favoring the leg.

DALE M. WARREN

Ft. Scott, Kan.

Delivery of a 194 Pound Bovine Fetus

November 16, about 7:00 p.m., I received a frantic call for assistance to a farm west of here, to deliver a 12-year-old Holstein-Friesian cow of a calf which, incidentally, was a result of artificial insemination. The cow had been in labor approximately four hours at the time I was called. The owner had attempted delivery unsuccessfully, but had not particularly disturbed the dam. Upon examination of the fetus its head was found to be turned back. This presentation was corrected with some little difficulty. A Moore's 60-inch obstetrical chain was looped around the head of the fetus and a half hitch put on its lower jaw, to which traction was applied. Delivery was effected by employing the technic that Dr. J. H. Winter, Brooklyn, Michigan, ably described in his article "Discouraging Dystocias Relieved by Upward Traction," which appeared in the May, 1946, issue of VETERINARY MEDICINE, page 177.

A description of the fetus that was delivered is almost unbelievable. It was a Holstein-Friesian heifer and weighed 194 pounds. It measured five feet from the tail head to the tip of the nose. The circumference in the thorax, immediately behind the front legs, was four feet, seven inches, and of the abdomen directly in front of the hind legs was three feet, eleven inches. With the exception of being extremely large, the fetus was normal, but dead, due to severe traction efforts applied by the owner and myself to effect delivery. According to the breeding date, the cow had carried the calf 290 days. I returned to the farm the following day to remove the placental membranes, at which time the cow seemed to be doing satisfactorily.

In a review of the literature, with one exception, I have been unable to find any record of a larger bovine fetus having been delivered and in that case the dam died without getting up (Vet. Med., Dec., 1946, p. 454). This prompted me to report this case, and to embrace the opportunity to express my thanks to VETERINARY MEDICINE and to Doctor Winter for the timely article referred to in the foregoing.

JOHN M. HURD

Schleswig, Ia.

Unusually Fecund Cow

A client of ours here in Pontotoc County, Oklahoma, has a registered shorthorn cow with a rather interesting history.

This cow is nine years old and has given birth to 10 calves, four sets of twins and two single births, and is two months pregnant again. Three sets of the twins have been heifers and one set bulls. The owner of this cow can not recall, definitely, just how many different bulls were sires of the calves.

The twin bulls are now in service in other herds in this section. We have not had an opportunity to check on their get.

ORAL M. SANDERS

Ada, Okla.

Endometritis and Neoplasms in a Dog

An eleven-year-old, female cocker spaniel, owned by a physician, was brought to the clinic Nov. 18, 1946, for examination. She had a history of having had a litter of pups at four years of age, and since had not been bred. At six years of age she developed a chronic endometritis accompanied by profuse hemorrhage throughout her estrual periods. This state of affairs had continued to the present time. The owner consulted a veterinarian who advised him to breed her again. The dog had been given stilbestrol and sulfa drugs, the amount not stated.

On examination, the vagina and cervix were found to be studded with fibromas. On abdominal palpation, the uterus was discovered to be thickened, but not too greatly enlarged. The patient was put on perandren, Ciba's name for testosterone, 5mg every other day. This treatment was discontinued after two weeks because she developed muscular stiffness and anorexia. While she was on perandren, the hemorrhage from the vulva subsided. However, it started again when the perandren was discontinued.

When the bitch was returned to the clinic Dec. 8, the muscular stiffness had gone, but she showed dullness, a temperature of 103.2° F., poor appetite, congestion of the visible mucous membranes, both oral and ocular, distention of the lower portion of abdomen. The uterus was easily palpated and found to be greatly enlarged. The owner desired an ovariohysterectomy, nothwithstanding he was told the patient was a poor surgical risk. Physical examination revealed a valvular leak, therefore, a very unfavorable prognosis was given, with or without operation.

To prepare the patient for the operation, she was given 150cc of 5% dextrose in saline solution, 1cc of liver extract and 20,000 units of penicillin intravenously. This was repeated the next day with 40cc normal serum added at 8:00 a.m., 2:00 p.m., and 8:00 p.m. The following day, immediately before the operation, she was given 75cc of 5% dextrose in saline solution, 75cc of normal serum, and 1cc of adrenalin intravenously.

The patient was placed on the operating table in dorsal recumbency and the operative area was prepared. Ether was employed for anesthesia. Twice during the operation the patient suffered respiratory embarrassment, but was revived by two drops of coramine on the tongue, and artificial respiration.

In appearance the organ resembled a pregnant uterus

Immediately after the operation, the patient was given 1cc adrenalin and 150cc of 5% dextrose in saline solution, intraperitoneally. When the spaniel was removed from the operating table, she was placed in a heated cage and watched very closely for a few hours.

The operation was completed at 4:00 p.m. At 7:00 p.m. she was given 1cc of adrenalin, 1cc of liver extract, and 100cc of 5% dextrose in saline solution, intraperitoneally. This seemed to stimulate her at the time, but at 11:15 p.m. she died.

The uterus resembled a pregnant one in appearance. It was approximately 15 inches long and 1.75 inches in diameter. The mucosa was greatly thickened and the entire uterus showed evidence of chronic inflammation. It presented a sausage-like appearance, due to the fibromas, and the large amounts of pus within it. *Escherichia coli* and hemolytic streptococci were isolated from the pus in the uterus.

H. W. KINARD

Clemson, S. C.

Abstracts

Susceptibility of Cholera Immune Swine to Erysipelas

As is well known, artificial infection of swine with *Erysipelothrix rhusiopathiae* is difficult, by the usual routes of inoculation. Because of this Doyle[15] was experimenting with intracerebral inoculation and made an interesting and, possibly, important observation. In his tests the animals that had been immunized to hog cholera (crystal violet vaccine and virus later) showed a marked susceptibility to erysipelas but cholera susceptible swine possessed a high degree of tolerance for intracerebral inoculation of *E. rhusiopathiae*.

In the author's first experiment, comprising seven cholera-immune and five susceptible pigs, all the immune and one of the susceptible pigs died of acute swine erysipelas in from 48 to 96 hours. Four of the five susceptible pigs exhibited only a brief period of dullness and inappetence.

In the second experiment comprising 10 cholera-immune and five susceptible pigs, seven of the immune died and the remaining three showed a severe reaction. Of the five susceptible pigs two showed severe and three slight reactions. None died.

In a third experiment in which two pigs, one immunized against hog cholera and one susceptible, both being inoculated intracerebrally with *E. rhusiopathiae*, the immune animal died in 96 hours, the susceptible one was but slightly affected.

In an earlier experiment six boars were used. Two were cholera-immune, four susceptible. The injection of the erysipelas organisms was made into the testicles. The immune boars died; two of the susceptible boars were slightly affected and two were unaffected.

Thus of 20 cholera-immune swine inoculated, 17 died and of 15 cholera susceptible pigs inoculated only one died.

The author observes that in countries where immunization of swine to hog cholera by the use of virus is practiced, swine erysipelas is a serious disease, often acute and having a tendency to spread to new areas. In England where the use of virus in immunization is not practiced (except in controlled experiments) swine erysipelas is a mild chronic disease showing no tendency to spread to new areas. However, he states, on the basis of these observations, the conclusion is not justified that hog cholera immunization influences the natural infection of swine with *E. rhusiopathiae* under field conditions.

[15] Doyle, T. M. The susceptibility of swine fever immune pigs to intracerebral inoculation with *Erysipelothrix rhusiopathiae*. *Vet. J.*, 103:1, pp. 11-17. 1947.

Iodinated Casein Increases Milk Flow

It is known that the milk yield of cows can be substantially increased by feeding iodinated casein during the middle and later part of lactation. The optimum increase in milk yield is 20% and the loss of weight caused by increased thyroid activity can be balanced by feeding extra concentrates. This article[19] deals with a large-scale experiment on commercial farms in England and Wales, in which a total of 1,164 cows were used, half of them being fed iodinated casein incorporated in cattle cubes for a period of six weeks. The iodinated casein was tested for biological activity using Xenopus tadpoles and the daily dose was 20gm of a mixed sample incorporated in four pounds of cattle cubes.

The 102 herds were spread over 97 farms in 37 counties in England and Wales and included a variety of breeds. The period of dosing was preceded by a preliminary period of observation of two weeks and a final period of four weeks. Cows in each herd were paired on a basis of age, stage of lactation, milk yield, breed and bodily condition and one of each pair was used as a control.

The following are the main conclusions:

1. Four per cent of the animals refused the iodinated casein, refusals being more common among Channel Island cattle.

2. The mean increase in daily milk yield was 5.44 pounds (22.2%) and the total increase was approximately 25 gallons per animal over the six-week period. Heifers gave a poorer response than mature cows, probably because of their higher metabolic rate.

3. The increase in milk yield was greater the longer the cow had been in milk when dosing began: cows which maintained good yields of milk when over half-way through their lactations responded particularly well. It seemed that the response to dosing with iodinated casein depended on the metabolism of the udder cells and the amount of udder parenchyma available for stimulation.

4. When iodinated casein was withdrawn, the milk yield remained high for a few days and then fell severely. The fall was made less abrupt by feeding additional food and by gradual reduction in the dosage of iodinated casein.

5. Approximately 20% of the cows lost weight, as judged by eye; weighing showed that the smaller animals lost most weight.

6. The heart rates of some of the animals were taken and showed an average increase of 10.2 beats per minute, the increase being

[19] Baxter, K. L. Experiments with iodinated casein on farms in England and Wales. *J. Agr. Sci.*, 36, pp. 117-150. 1946. Abst. from *Vet. Bul.*, 16:12, p. 444. 1946.

less in heifers. The normal heart rate of control heifers was higher than in control mature cows.

7. Overdosing with iodinated casein caused severe symptoms of hyperthyroidism.

8. It is recommended that iodinated casein be used on selected farms where increases in milk production can not be obtained by attention to management, disease control, or better feeding. The dangers of overdosing are stressed: animals of the small breeds should receive only 15gm daily. It is calculated that at current prices the use of iodinated casein would be highly economic and that the total winter milk production in many herds could be increased by over 10% during February and March.

Chlorophyll Best of Wound Dressings

A report from the Winter (Army) General Hospital, recording the use of chlorophyll over a nine-month period in the treatment of more than 400 clinical cases representing a wide variety of surgical conditions proclaims this drug to be the most satisfactory application now known for infected wounds.[20]

When using chlorophyll for infected wounds, a rapid disappearance of objectionable odors associated with remarkable cleanliness of the wound within two or three days was noted. Granulation tissue seemed to be firmer, of finer texture, and to form more rapidly with chlorophyll than with agents previously used. Epithelization also appeared to be stimulated more by chlorophyll than by agents such as penicillin. No skin irritation or adverse systemic reactions have been noted. Chlorophyll wet dressings are more comfortable than similar dressings with saline solution, boric solution, or penicillin. If chlorophyll is used as a wet dressing over a period of a week or more, there is a tendency to overproduction of granulation tissue, so that after the wound is clean and odorless it is advocated that chlorophyll ointment gauze be used instead of the wet dressing.

It was noted in all suppurating cases that chlorophyll caused cessation of pus formation in two or three days, and thenceforth there was only a slight serous discharge. This includes the osteomyelitis and thoracic empyema cases which are noted for prolonged suppuration when treated by other means. In the nasal and sinus cases it was noted that chlorophyll gave more rapid changes in the nasal mucosa and had a quicker effect in stopping purulent drainage than other agents. All these patients have noted a freer breathing after chlorophyll instillation without the disagreeable aftereffects of ephedrine. All medical officers and patients have noted the bland qualities of chlorophyll and the tolerance of the patient even when it was instilled into the eye, the nose, deep intra-abdominal abscess cavities, and the pleural cavity. It is to be emphasized that chlorophyll is not antibacterial and is but weakly bacteriostatic so that its beneficial effect is exerted through stimulation of the cells of the host. That this agent is efficacious is evidenced by the fact that this hospital used one-half to one-third the amount of penicillin used by other Army general hospitals treating similar cases. We believe that the water-soluble chlorophyll preparations have a broad military application and that wide use is highly desirable. Chlorophyll is not a cure-all, but we are convinced that it is the best agent now known for use in the treatment of suppurative diseases, indolent ulcers, or where stimulation of tissue repair is desired and local application of this drug is possible.

[20] Bowers, Lt. Col. Warner F. *Am. J. Surg.*, 73, pp. 37-50. 1947. Abst. from *Bul. U. S. Army Med. Dept.*, 7:3, pp. 255-256. 1947.

Toxic Heart Degeneration in Fowl

Enzootic outbreaks of sudden fatal syncope in chickens, characterized by enlargement and parboiled appearance of the heart, have been observed for some years in parts of New Zealand.[16] The etiology of the condition is unknown. Bacteriological examinations were negative as were also transmission experiments.

The birds died suddenly without showing any symptoms. On necropsy the carcasses were observed to be those of well nourished fowls in good condition. The heart was enlarged almost spherical and of parboiled appearance. There was moderate serous effusion into the pericardium. The parenchymatous organs and the muscles were slightly edematous and showed marked venous congestion.

These lesions do not agree with any known condition and are suggestive of a toxic condition of undisclosed origin.

Control of Avian Coccidiosis

A new method,[18] for the control of coccidiosis in chickens, sponsored by the Dominion Department of Agriculture, is being tried in Canada this year.

Three plans are suggested to the poultry industry. The first, applicable to small flocks—farms where one to three batches of chicks are raised yearly and, from past experience, where coccidiosis is not expected to occur. This plan contemplates only the employment of

[16] W. G. Fischel, D. M. V. Enzootic fatal syncope in fowls. Australian *Vet. J.*, 22:5, pp. 144-149. 1946.

[18] Swales, W. E. New method of controlling cecal coccidiosis in chicks. *Canadian J. Comp. Med. & Vet. Sci.*, 11:1, pp. 5-10. 1947.

sanitation, dryness and cleanliness to keep down the amount of infection and thus permit the chicks to acquire immunity to coccidiosis slowly and safely.

The second plan applies to premises where the disease is expected to appear, particularly during the "coccidiosis season"—May and June. This plan involves the use, at the first sign of the disease, of sulfonamides—sulfamerazine or sulfamethazine and the sodium salts of these agents. Each chick, three to four weeks of age, is to be given 80mg of the sulfonamides in the feed or water daily for a period of three days. This is accomplished by mixing sulfamerazine or sulfamethazine in the mash at the rate of one ounce of the drug to 15 pounds of feed. Or the sodium salt of either agent may be dissolved in the drinking water at the rate of one ounce to 15 quarts. Treated in this way the flock attains an immunity to coccidiosis that avoids further loss.

The third plan is for plants where large groups of chicks are brooded in rapid succession as in the production of broilers or started breeding stock. In such plants cecal coccidiosis is a particularly serious hazard. In these large plants, it is recommended that a pen highly contaminated with *Eimeria tenella* be maintained and that all chicks be placed in this pen at two to four weeks of age and kept there for six days. During the time the chicks are in the immunizing pen they are given the sulfa drugs in the feed or water at the rate of one ounce to 40 to 60 pounds of starter mash or in six to 7½ imperial gallons (one-fourth more U. S. gallons) of drinking water. The objective being that each chick shall receive 30 to 40mg on each of the six days that it is in the immunization pen.

This plan has worked well in practice on large farms. The chicks are not immunized to *E. necatrix* by this method and must be protected from this organism by keeping the floors dry as the birds develop to broilers or breeding stock.

For the success of these plans for the control of coccidiosis, which has heretofore taken a heavy toll from the Canadian poultry industry, the Dominion department of agriculture is relying on full cooperation of the veterinary profession, not only to supply the drugs but to guide the poultry raiser in their use, in the detection of the first symptoms of coccidiosis appearing in his flock and in all measures having to do with the operation of these plans for the control of the disease. In Canada the sulfa drugs are available only upon prescriptions of physicians and veterinarians and the latter are cautioned, as to unfavorable developments if an unreasonable price is charged for these remedies.

Diethylstilbestrol in the Treatment of Orchitis

For a quarter century, and perhaps longer, veterinarians have practiced the castration of old dogs as a treatment for hypertrophy of the prostate and for perineal hernia—a common sequel of a grossly enlarged prostate in aged dogs. The operation was attended by a large measure of success. Since many, possibly most, enlarged prostate glands in the dog are carcinomatous, this castration was actually a treatment, and a markedly successful treatment for carcinoma in the dog.

Within the past few years[22] the medical profession has employed castration to some extent for the relief of carcinoma of the prostate in man, with gratifying results. Not many cures were effected but the condition was ameliorated, life prolonged and made more comfortable in a large percentage of the cases. This difference in the outcome of the operation in the two species was to be expected; cancer being far more resistant to treatment in man than it is in the dog. As usual the medical profession considered this treatment for carcinoma to be its own discovery. That too was to be expected. It's routine.

Naturally some patients were reluctant to undergo the operation and often delayed it until optimum time had passed. As being less objected to (because its effect is temporary) diethylstilbestrol, "chemical castration," was tried and found more effective than surgery in bringing about regression of prostate new growths. Veterinarians have found the chemical more effective than the surgical treatment in dogs also.

Because estrogens are known to exert a degenerative influence on all male sexual organs, including atrophy of the testicles, Savran[1] employed diethylstilbestrol as a preventive of orchitis in mumps. The rationale being that since orchitis, as a complication of mumps, is uncommon in pre-adolescent patients, but ranges from 16 to 30% in soldiers, the functional activity of the organs probably predisposes them to the inflammatory attack. The treatment was spectacularly successful.

This suggests a trial of this drug in orchitis in valuable bulls and boars. In cases of Brucella infection of the testicles in both species, at times a considerable period elapses before abscesses develop. Possibly by decreasing the activity of the organs during this period, the prompt disappearance of the infection from the involuting uterus, might be duplicated in the testicle.

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[22] Savran, J. Diethylstilbestrol in the prevention of orchitis following mumps. *Rhode Island Med. J.*, 29, p. 662. 1946.

Book Reviews

Handbook of Microscopic Characteristics of Tissues and Organs.—By *Karl Styles*, M.S., Ph.D., Professor of Biological Science, Michigan State College. Formerly Bert H. Bailey, Professor of Biology and Chairman of the Division of Natural Sciences, Coe College. With an introduction by *Melvin H. Knisely*, Associate Professor of Anatomy, University of Chicago. Third edition; attractively spiral bound in leatherette; 214 pages, approximately one-half blank for notes and drawings. Published by The Blakiston Company, Philadelphia, 1946. Price $1.75.

Professor Knisely states "the important functions of this book are to help students to learn to recognize tissues rapidly, and to fix firmly in their minds the descriptive phases which go with the salient features of the microscope-image-pictures presented by histological sections. It is a necessity."

It is the author's view that this handbook will be a great time saver for the student who is beginning a course in histology and an excellent guide for those who wish to review the subject for examinations or other purposes. It may also be used supplementary to a regular textbook on histology or as a syllabus to lectures and as a laboratory guide.

The text is in outline form listing the salient characteristics of each tissue together with illustrations of microscope slides.

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How to Raise a Dog in the City and in the Suburbs.—By *James B. Kinney*, Chief Veterinarian, Ellin Prince Speyer Hospital, and *Ann Honeycutt*. Illustrated by *James Thurber*. 273 pages. Published by Simon and Schuster, New York, 1946. Price $2.00.

Books intended to make amateur ownership of dogs in the city more pleasurable for both owners and owned are numerous. The best of them are those, possibly a dozen, written by veterinarians. The advantage of veterinarians in this field derives from their vast experience with dog owners, more or less unsuccessful owners, as well as from their expert knowledge of the care of dogs. This work, by the chief veterinarian, and an associate, of one of the half-dozen, best known animal hospitals in the country, combines experience with many thousands of dog owners and expert knowledge on the subject of dog care with the ability to write entertainingly, often humorously. Humorous features are strikingly emphasized by the James Thurber illustrations which "are guaranteed to be anatomically incorrect but painstaking and psychologically accurate."

Veterinarians obtain books of this sort for their waiting rooms. This one will serve this function with the best and is entertaining as well as instructive.

The Horseman's Encyclopedia.—By *Margaret Cabell Self*. Author of Horses, Their Selection, Care and Handling, Fun on Horseback, As Treasury of Horse Stories and Teaching the Young to Ride. 519 pages, 82 illustrations. Published by A. S. Barnes & Co., New York, 1946. Price, $5.00.

The publisher's description of this work as "an original compilation of all that is known about the horse from the days of Paleolithic man down to the present—a whole library in one volume," is something of an exaggeration born of enthusiasm. However, in its astonishing range, something of just about everything that concerns the horse, is told in this book. The vocabulary of horsemen is complete even to including the Spanish terms of the vaqueros of the Southwest, everything from Agarophobia to Zebra. There are lists of hunt clubs and racing associations, of famous horses of fact and fiction and of famous owners, of leading money winners (horses and owners) and of sires and a history of each breed. The illustrations are excellent and many of them of historical interest. A brief, lay description of most of the common diseases and injuries of the horse is given. The rules are given for horse shows and games and hunts and races, etc.

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49. Bulletins and Circulars should be requested direct from the address given in the notice. Generally they are supplied free unless a price is stated.

Turkey Management. — By *Stanley J. Marsden*, B.S., M.S., Poultry Husbandman, The Agricultural Research Center, USDA, Beltsville, Maryland, and *J. Holmes Martin*, Ph.D., Head of the Poultry Department, Purdue University. Fourth Edition; 773 pages; 139 illustrations. Published by The Interstate, Danville, Ill., 1946. Price $4.50.

The second edition of this work was extensively reviewed in these pages (Dec., 1944, pp. 469-470). The present edition has been completely revised to bring it up to date in every respect.

It is a handbook of the turkey industry. Everything from origin of the species to marketing the annual crop is discussed. In between the origin and the market the authors discuss: the turkey's place in agriculture, turkey shows and showing, breeding principles and practices, artificial insemination, incubation, brooding and rearing, caponizing and sexing, feeds and feeding, malformations and

bad habits, disease prevention and sanitation (20 pages), diagnosis and control of diseases and parasites (40 pages) and various other subjects.

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Bovine Mastitis.—Edited by *Ralph B. Little*, V.M.D., Department of Animal and Plant Pathology, The Rockefeller Institute for Medical Research, and *Wayne N. Plastridge*, Ph.D., Department of Animal Diseases, The University of Connecticut. 546 pages; illustrated. Published by McGraw-Hill Book Company, Inc., New York, 1946. Price, $7.00.

Since the development of agents that provide effective treatment of mastitis through udder infusion, there has been a keen demand for a book that would bring together and integrate the information on the subject. That is precisely the objective of the present work. The editors have enlisted the aid of a distinguished corps of research workers, whose reports include, not only their own contributions to the knowledge of bovine mastitis, but a review of all other research in this field.

There are 17 chapters in the book; the subjects discussed in each and the authors are:

I, Anatomy of the udder by M. A. Emmerson, D.V.M., professor of obstetrics, Iowa State College. II, Physiology of milk secretions by Charles W. Turner, Ph.D., professor of dairy husbandry, University of Missouri. III, Pathology of mastitis by Lloyd B. Sholl, D.V.M., associate professor of animal pathology, Michigan State College. IV, Diagnosis of mastitis by Leland J. Tompkins, D.V.M., sanitarian New York and Kings County medical milk commissions, Claude S. Bryan, D.V.M., head, department of surgery and medicine, School of Veterinary Medicine, Michigan State College and Wayne N. Plastridge, Ph.D. V, Bacteriology of mastitis by Ralph B. Little, V.M.D., and J. Howard Brown, Ph.D., associate professor of bacteriology, Johns Hopkins University, School of Medicine. VI, Serological classification of mastitis streptococci by Arthur W. Stableforth, M.R.C.V.S., Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, England. VII, Environmental and Hereditary factors by Ralph B. Little, VIII, Transmission by Ralph B. Little. IX, Mastitis in heifers by Oscar W. Schalm, D.V.M., professor of veterinary medicine, University of California. X, Eradication of Chronic Mastitis by Wayne N. Plastridge. XI, Vaccination in the control of bovine mastitis, by Claude S. Bryan and Wayne N. Plastridge. XII, Treatment of bovine mastitis by Oscar W. Schalm and Ralph B. Little. XIII, Public health aspects of bovine mastitis by J. Howard Brown. XIV, Relation of bovine mastitis to quality of dairy products by Elmer O. Anderson, M.S., associate professor of dairy husbandry, University of Connecticut. XV, Stable hygiene in the control of mastitis for the production of clean milk by Claude S. Bryan, Oscar W. Schalm and Wayne N. Plastridge. XVI, Recommendations for state control programs by Oscar W. Schalm, Claude S. Bryan and Wayne N. Plastridge, and XVII, Mastitis in goats, by Claude S. Bryan.

An appendix gives directions for making all laboratory tests of milk for the detection of mastitis. An addendum describes an outbreak of acute mastitis in which there was moderate elevation of the temperature, but the outstanding feature was ropy, bloody milk. The senior editor isolated a virus from the milk that reproduced a mild form of the disease when injected, subcutaneously, into cows.

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Diagnostic Methods in Veterinary Medicine.—By *Geo. F. Boddie*, B.Sc., M.R.C.V.S., F.R.S.E., Professor of Medicine, Royal (Dick) Veterinary College, Edinburgh, Scotland, with a chapter on Clinical Hematology by *H. H. Holman*, D.Sc., Ph.D., M.R.C.V.S., Pathologist, Agricultural Research Council, and a chapter on Diagnosis of Poultry Diseases by *J. G. Campbell*, Royal (Dick) Veterinary College. Second edition; 370 pages; 50 figures and four full-page color plates. Published by Oliver and Boyd, Edinburgh, 1946. Price (delivered in U. S.), $3.50.

That the demand for this work should exhaust the first edition in two years supports the high opinion of it expressed by all reviewers of the first edition. The demand for it in this country has exceeded that of any other imported veterinary book in recent years.

The plan of the work remains the same as in the former edition (see review, *Vet. Med.*, 39:9, p. 362, 1944). Some chapters have been rewritten, enlarged and improved. Thus chapter 11, Genitalia and Mammae, has been extended to include the clinical diagnosis of the various forms of mastitis and a brief discussion of the diagnosis of pregnancy. Chapter 12, Locomotor System, has been extended from one page to seven pages and the discussion of clinical bacteriology (chapter 16) has been more than doubled in scope and contains four full-page color plates, each showing two slides of stained organisms to illustrate the use of the different stains commonly employed in a bacteriological laboratory.

One entirely new chapter, Diagnosis of Poultry Diseases, has been added to this edition. This chapter discusses very briefly the salient-differences in mammalian and avian anatomy, the diagnosis of disease on the farm, necropsy technic and the lesions characteristic of various common diseases of poultry. The collection of specimens for laboratory exami-

nation and the tuberculin and pullorum tests also are described.

A new edition, instead of a reprint of "Boddie's Diagnosis," is a welcome sign that the authors and the publishers intend to improve the work as opportunity offers and keep it abreast of progress in pathology.

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Feeding Poultry.—By *Gustave F. Hueser,* Professor of Husbandry, New York State College of Agriculture and The School of Nutrition and Poultry Husbandman, Agricultural Experiment Station, Cornell University. 543 pages. Published by John Wiley & Sons, Inc., New York. 1946. Price, $4.50.

Life long study and 30 years of research and teaching in the field of poultry nutrition have equipped the author to compile, evaluate and summarize the essential scientific and practical facts about poultry feeding and present them authoritatively, comprehensively and at the same time concisely. It brings together in a single volume the many and extensive changes that have taken place in poultry feeding as a result of developments in the science of animal nutrition.

The objects and principles of poultry feeding, the composition of plants and animals, and the physiology of digestion are discussed, preliminary to a consideration of specific poultry feeds. Probably every feedstuff on which any research has been done is mentioned, and every system of feeding evaluated.

The feeding of chickens, turkeys, waterfowl, pheasants, pigeons, canaries, and ostriches come under review. Tables are given for feed requirements for chickens of different sizes, at different stages of growth, and for layers at different rates of production, etc.

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A Veterinary History of North Carolina.—By *J. H. Brown, Wm. Moore* and *L. J. Faulhauber.* Second edition, 108 pages; published by the North Carolina State Veterinary Medical Association, 1946.

The general approval with which the first edition of this history was received no doubt encouraged the same committee of the North Carolina association to revise it to include the history of veterinary medicine in the Tarheel State since 1934, the date of the first edition.

It is noted, that in 1934, 56 of the 96 veterinarians in the state were members of the state association and that 12 years later 108 of the 156 veterinarians in the state were members of the association. Also that the first Chief of the Bureau of Animal Industry and the present Chief began their professional careers in North Carolina.

The authors modestly assert they are not attempting to write history, but to place facts on record for the use of future historians. This objective they have accomplished well, but many readers will wish that more information were given about North Carolinians who loomed large in veterinary affairs on the national scene. For example Cooper Curtice was the first state veterinarian of North Carolina and Tait Butler was the second. Both men went on to high achievement in the national field. D. E. Salmon was a practitioner at Asheville before he rose to national and international fame in veterinary and livestock circles. Biographical sketches of those and other leaders would add not a little to the interest of the volume. Any mention of the great development of the poultry industry in North Carolina and the not inconsiderable part that veterinarians contributed to this development seems to have been overlooked by the authors.

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Useful Bulletins, Circulars, Etc.

Anaplasmosis in Cattle.—Circ. No. 154 (revised Aug., 1946), USDA, Washington 25, D. C.

Artificial Insemination.—Bul. 336. Minnesota Agr. Exp. Sta. University Farm.

Fowl Typhoid.—Circ. No. 755. USDA, Washington 25, D. C.

How to Ship Dogs.—One of the Judy Handy Dog Booklet Series—5th edition. Judy Publishing Co., Chicago. Price 30 cents.

Hydrocephalus: a Lethal in Cattle.—Reprint from *J. Agr. Res.,* 65:10. Superintendent of Documents, Government Printing Office, Washington, D. C.

Blackleg.—The nature, cause and prevention of blackleg (revised 1942). Farmers' Bul. No. 1355, Superintendent of Documents, Washington, D. C. Price 5 cents.

Hemorrhagic Septicemia. — The nature, cause, control and prevention of "shipping fever" in cattle (revised 1944). Farmers' Bul. No. 1018. Superintendent of Documents, Washington, D. C. Price 5 cents.

Inherited Hydrocephalus.—Hidrocefalia, uma nova Mutacao no Coelho (with extensive English summary), by Francisco Mario da Rosa. 55-page reprint from *Revista de Medicina Veterinaria,* Lisbon, Portugal.

Congenital Luxation of the Hip.—Uma nova Mutacao, Luxacao Congenita da Anca no Coelho (with English summary), by Francisco Mario da Rosa. 23-page reprint from *Revista de Medicina Veterinaria,* Lisbon, Portugal.

Periodic Ophthalmia.—Report of a commission (five veterinarians) for the study of this disease by direction of the Director General of the Remount Service of the Argentine Army. 69 pages. No English summary. Extensive bibliography. Available from la Direction General de Remonta, Ejercito Argentino, Buenos Aires, Argentina.